ENVIRONMENTAL ASSESSMENT WORKSHEET

Rochester Water Reclamation Plant Expansion – Trunk Sewer Extension

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LIST OF ACRONYMS

Acronym	Definition
ADT	Average Daily Traffic
BALMM	Basin Alliance for the Lower Mississippi in Minnesota
BMPs	Best Management Practices
BOD	Biological Oxygen Demand
$CBOD_5$	Five-Day Carbonacious Biological Oxygen Demand
City	City of Rochester
CO	Carbon Monoxide
CR	County Road
CSAH	County State Aid Highway
CWA	Clean Water Act
CWI	County Well Index
dBA	Decibels, as a time weighted average
DEIS	Draft Environmental Impact Statement
DEOZ	Decorah Edge Overlay Zone
DNR	Minnesota Department of Natural Resources
D-P-G	Decorah-Platteville-Glenwood
DO	Dissolved Oxygen
DWSMAs	Drinking Water Supply Management Areas
EAW	Environmental Assessment Worksheet
EIS	Environmental Impact Statement
EQB	Environmental Quality Board
FHWA	Federal Highway Administration
FEIS	Final Environmental Impact Statement
gpad	Gallons per Acre per Day
gpd	Gallons per Day
GDP	General Development Plan
GIS	Geographic Information System
GLUP	General Land Use Plan
gpcd	Gallons per Capita per Day
HAPs	Hazardous Air Pollutants
HHW	Household Hazardous Waste
HRLs	Health Risk Levels
kHz	Kilohertz

LIST OF ACRONYMS
(continued)

Acronym	Definition
kg/day	Kilograms Per Day
km	Kilometer
kW	Kilowatt
L_{10}	sound level exceeded 10 percent of a specific time period
LEQ	Equivalent Sound Level (Steady A-weighted sound over a given period)
LOS	Level of Service
LUST	Leaking Underground Storage Tank
Max	Maximum
MDH	Minnesota Department of Health
mgd	Million Gallons per Day
mg/L	Milligrams per Liter
MG's	Minimal Hazardous Waste Generator's
MGS	Minnesota Geological Survey
MHS	Minnesota Historical Society
MIAC	Minnesota Indian Affairs Council
Min	Minimum
mL	Milliliter
MLCCS	Minnesota Land Cover and Classification System
MMBTU	Million British Thermal Units
MnDOT	Minnesota Department of Transportation
Mn/Model	Minnesota Archaeological Predictive Model
MPCA	Minnesota Pollution Control Agency
MS4	Municipal Separate Storm Sewer Systems
MSW	Municipal Solid Waste
Northeast	NE
Northwest	NW
ng/l	Nanograms per Liter
NH_3	Ammonia
NH_3-N	Ammonia Nitrogen
NHP	Natural Heritage Program
NO_3-N	Nitrate-nitrogen
NO_X	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OSA	Office of State Archaeologist
PCB	Polychlorinated biphenyl
PM_{10}	Particulate Matter less than 10 um in size
PTE	Potential to Emit
PWI	Protected Waters Inventory
RGRMA	Rochester Groundwater Recharge Management Area
RGU	Responsible Governmental Unit
ROCOG	Rochester-Olmsted Council of Governments
ROPD	Rochester-Olmsted Planning Department
RPA	Resource Protection Area
RPU	Rochester Public Utilities

LIST OF ACRONYMS
(continued)

Acronym	Definition
RWRP	Rochester Water Reclamation Plant
$7Q_{10}$	seven consecutive-day, ten-year low flow
SCS	Soil Conservation Service (now NRCS)
SDA	Suburban Development Area
SDS	State Disposal System
SHPO	Minnesota State Historic Preservation Office
SNA	Scientific and Natural Area
SO_2	Sulfur Dioxide
SWPPP	Stormwater Pollution Prevention Plan
TAC	Technical Advisory Committee
TCE	Trichloroethylene
TDP	Transit Development Plan
TH	Trunk Highway
TMDL	Total Maximum Daily Load
tpy	tons per year
TSS	Total Suspended Solids
URA	Urban Reserve Area
USA	Urban Service Area
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VIC	Voluntary Investigation and Cleanup
vpd	Vehicles per Day
VOC	Volatile Organic Compound
VSQGs	Very Small Quantity Hazardous Waste Generators
WCA	Wetland Conservation Act

ENVIRONMENTAL ASSESSMENT WORKSHEET

Note to reviewers: The Environmental Assessment Worksheet (EAW) provides information about a project that may have the potential for significant environmental effects. This EAW was prepared by the Minnesota Pollution Control Agency (MPCA), acting as the Responsible Governmental Unit (RGU), to determine whether an Environmental Impact Statement (EIS) should be prepared. The project proposer supplied reasonably accessible data for, but did not complete the final worksheet. Comments on the EAW must be submitted to the MPCA during the 30-day comment period, which begins with notice of the availability of the EAW in the *Minnesota Environmental Quality Board (EQB) Monitor*. Comments on the EAW should address the accuracy and completeness of information, potential impacts that are reasonably expected to occur that warrant further investigation, and the need for an EIS. A copy of the EAW may be obtained from the MPCA by calling (651) 296-7398. An electronic version of the completed EAW is available at the MPCA Web site http://www.pca.state.mn.us/news/eaw/index.html#open-eaw.

1.0 PROJECT TITLE Rochester Water Reclamation Plant Expansion – Trunk Sewer Extension

2.0 PROPOSER

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4.0 REASON FOR EAW PREPARATION

EIS Scoping	Mandatory EAW	Citizen Petition	RGU Discretion	Proposer Volunteered
	✖			

If EAW or EIS is mandatory give EQB rule category subpart number and name: Minn. R. ch. 4410.4300, subp. 18, Item A and Item B.

Minn. R. ch. 4410.4300, subp. 18, Item A states: "For expansion, modification, or replacement of a municipal sewage collection system resulting in an increase in design average daily flow of any part of that system by 1,000,000 gallons per day (gpd) or more, the MPCA shall be the RGU." Each of the sewer extensions addressed in this EAW are planned to meet potential wastewater conveyance needs through the year 2035 and have projected flows in excess of 1,000,000 gpd. Cumulative flow totals for all of the extensions are shown in Table 18-3.

Minn. R. ch. 4410.4300, subp. 18, Item B states: "For expansion or reconstruction of an existing municipal or domestic wastewater treatment facility which results in an increase by 50 percent or more and by at least 50,000 gallons per day of its average wet weather design flow capacity… the PCA shall be the RGU."

The first and second phases of Rochester Water Reclamation Plant (RWRP) Expansion that are planned to meet the City of Rochester's (City's) wastewater treatment needs through the year 2025 would not trigger a mandatory EAW. However, the City has decided to address the three future expansion phases that may be needed to meet potential wastewater treatment needs through 2035 in order to address a timeframe consistent with the trunk sewer extensions addressed in this EAW. The total projected capacity increase for the three phases of the RWRP Expansion is 14.25 million gallons per day (mgd), and would trigger a mandatory EAW since the RWRP projected capacity increases "50 percent or more and by at least 50,000 gpd of its average wet weather design flow capacity" of 19.1 mgd.

5.0 PROJECT LOCATION

County Olmsted City/Twp City of Rochester

¼ ___ ¼ Section ___ Township ___ Range ___

See Tables 5-1 and 5-2 below for Township, Range, and Section information. Figures 5-1 and 5-2 show the general project location in the state, Olmsted County, and local jurisdictions. Figures 5-3 through 5-5 show the proposed RWRP Expansion area, the conceptual alignments of trunk sewer extensions, and the three related service areas (sewersheds): Kings Run, the Northwest Territory, and Hadley Valley. The sewershed boundaries are roughly based on surface watersheds for the areas that could be served by the proposed trunk sewer extensions and constitute the Project Area for this EAW. Secondary development that may occur within currently undeveloped portions of the sewersheds is also addressed in this EAW. It should be noted that portions of the three sewersheds are outside the 25-year Urban Service Areas (USAs) and 50-year Urban Reserve Areas (URAs) as designated by the Olmsted County Land Use Plan. To be fiscally conservative in planning for adequate RWRP capacity and trunk sewer extension sizing, the city of Rochester (City) has included areas feasibly served by the infrastructure expansions to avoid the potential for premature system replacement or expansion, should the Land Use Plan be amended to include additional portions of the sewersheds.

TABLE 5-1

ROCHESTER WATER RECLAMATION PLANT EXPANSION PROJECT LOCATION

Township	Range	Section
107	14	S ½ 14
107	14	N ½ 23

TABLE 5-2

TRUNK SEWER EXTENSION AND RELATED SEWERSHEDS PROJECT LOCATION

Township	Range	Section
107	13	S½ 7, S½ 8, S½ 9, S½ 10, SW¼ 13, S½ 14, 15, 16, 17, 18, 19, N½ 20, 21, N½ 22, NW¼ 23, and the N½ 30
107	14	SW¼ 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, S½ 12, 13, 14, 15, 16, 17, 18, N½ 19, 20, N½ 21, NW¼ 22, N½ 23, and the N½ 24
107	15	1, E½ 2, 11, 12, 13, N½ 14, NE¼ 15, and the NE¼ 24
108	14	S½ 21, W½ 22, W½ 27, 28, 29, S½ 30, 31, 32, 33, and the W½ 34
108	15	SE¼ 25, E½ 35, and 36

The 1995 Olmsted County General Land Use Plan designates a 25-year USA that includes land that is projected to be annexed into the City and served by municipal infrastructure within the next 25-year period. The 50-year URA adjacent to the USA acts as a holding zone for future urban development. For purposes of this EAW, a "worst case development scenario" was selected that predicted full development of the entire Project Area by 2035. In reality, development would likely occur through 2045 or later. This "worst case scenario" was used to establish maximum wastewater flow projections for the purposes of sizing the trunk sewer extensions and the

RWRP Expansion capacity and does not assure that this development will occur within all of the area encompassed by the sewersheds, rather existing land use planning processes will be needed before URA could be converted to USA.

The figures attached to this EAW are listed in the Table of Contents.

6.0 DESCRIPTION

6.a Project Summary

Provide a project summary of 50 words or less to be published in the *EQB Monitor.*

The city of Rochester proposes a three-phase expansion of its wastewater treatment plant, each adding a capacity of 4.75 million gallons per day. Several phases of trunk sanitary sewer extensions are also planned to serve approximately 22,000 acres of new growth areas as treatment capacity is added to the plant.

6.b Project Description

Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

6.b.1 Introduction

Future individual development and infrastructure projects that may occur within the Project Area may also be subject to EAW preparation regulations. Regardless of EAW regulations, these future development and infrastructure projects will be subject to the City's General Development Plan (GDP) review process and will have to obtain all required permits at the time the project is constructed. Table A-3 (Appendix A) presents a list of potential permits related to future secondary development.

6.b.2 Rochester Water Reclamation Plant Expansion

The RWRP Expansion is being planned to meet anticipated treatment needs through the year 2035 and will occur in three phases. The first phase of the RWRP Expansion, which will increase the treatment capacity by 4.75 mgd and is intended to serve through 2015, will be initiated in the 2004 construction season. Phase 2 of the expansion will increase treatment capacity by an additional 4.75 mgd to meet anticipated treatment needs through 2025. A third expansion is planned to meet potential treatment needs through 2035 by increasing capacity an additional 4.75 mgd. Figure 6-1 shows the RWRP potential expansion area available for ultimate expansion and Figure 6-2 presents a conceptual schematic of the proposed expansion area showing the three phases discussed in this EAW.

Table 6-1 provides an overview of the elements of each phase. The existing primary and secondary treatment processes will continue to be used after the expansion. A final determination has not been made as to which of the existing components will be modified for re-use, abandoned in place, or demolished. Elements that are demolished will be done so in accordance with appropriate regulations and demolition debris will be landfilled in a permitted facility.

After the RWRP Expansion, there will be two parallel primary and secondary treatment processes. The influent flow will be split behind the new grit chambers with a portion of the wastewater going to the existing primary clarifiers and the existing two-stage high purity oxygen activated sludge treatment process. The remainder of the influent flow will go to the new primary clarifier and the new single-stage activated treatment process. The flow from both the old and new final clarifiers will then be recombined prior to chlorination, dechlorination, and discharge of the final effluent through the existing outfall to the South Fork of the Zumbro River.

TABLE 6-1

ROCHESTER WATER RECLAMATION PLANT EXPANSION PHASES

Expansion Phase	Added/Cumulative Average Wet Weather Flow[1]	Service Period	Construction Period	Proposed Construction Elements (including modifications to equipment, processes, and operations)
Phase 1	4.75 mgd/23.85 mgd	2006-2015	2004-2006	• Evaluate need for visual screening • Complete preliminary site grading • Re-route drainageway • Re-align access road • Partial demolition, reuse, and remodeling of Phostrip Basins and Chemical Building • Add new raw sewage pumping station and headworks • Add one primary clarifier • Add two aeration basins • Add one final clarifier • Add one sludge storage tank • Add blower building • Add one gravity belt thickener • Add new dry polymer make-up and feed system • Add plant drain pump station • Add odor control facilities
Phase 2	4.75 mgd/28.60 mgd	2016-2025	2014-2016	• Add one primary clarifier • Add two aeration basins • Add one final clarifier • Add one sludge storage tank • Headworks equipment additions • Add truck loadout facility • Add odor control facilities
Phase 3	4.75 mgd/33.35 mgd	2026-2035	2024-2026	• Add one primary clarifier • Add two aeration basins • Add one final clarifier • Add one sludge storage tank • Headworks equipment additions • Add odor control facilities

[1] Note: Current Permit Capacity (Average Wet Weather Flow) = 19.1 mgd

6.b.2.1 General RWRP Site Work

The activated sludge treatment process used at the RWRP is a commonly used biologic process that converts the finely divided and dissolved organic matter in wastewater into flocculent settleable solids that can be removed in sedimentation tanks (Metcalf & Eddy, *Wastewater Engineering*, 1972, page 481). At the RWRP, wastewater containing dissolved organics and fine suspended organic solids flows into an aeration basin. High purity oxygen generated on-site is mixed into the wastewater using surface mixers in aeration basins with concrete covers. Naturally occurring microorganisms (primarily bacteria, but also protozoa, rotifers, and other microorganisms) are grown and recycled into the aeration tank where they are mixed with the incoming wastewater and oxygen. These microorganisms are a living active biomass referred to as activated sludge. It is the intent of the RWRP Expansion to maintain and enhance the activated sludge treatment process.

Surface-water drainage that enters the RWRP site from subwatershed districts encompassing 730 upstream acres, will be relocated to the 37th Street Northwest (NW) right-of-way. This drainage relocation will require a

box culvert for several hundred feet under the RWRP entrance road. The ditch downstream from the box culvert will include a low flow flume from the culvert to the discharge point to prevent erosion. Since there are some minor areas of hydric (wetland) soils mapped in the area, the culvert, and ditch work may require a Section 404 of the Clean Water Act (CWA) permit from the U.S. Army Corps of Engineers (USACE), a Minnesota Wetland Conservation Act (WCA) permit from the Local Governmental Unit, and a Minnesota Department of Natural Resources (DNR) Public Waters Permit. Related wetland identification, verification and, if required, delineations, and permit applications will be completed in the spring of 2004.

The land surface west of the existing final clarifiers is higher than the foundation of the new facilities. Considerable preliminary grading will be required to prepare the site for construction, including some bedrock removal. A geotechnical investigation is currently underway to define the bedrock limits and to develop a foundation construction approach for individual structures.

Roadway access will be provided around the south side of the facility expansion. The roadway on the west side of the existing final clarifiers that is currently used by trucks delivering liquid oxygen will be retained, but the grade will be adjusted to allow for the new tunnel.

6.b.2.2 New Raw Sewage Pumping Station and Headworks

As part of Phase 1, a new raw sewage pumping station and headworks will be constructed in the space currently occupied by the existing Phostrip Basins and Chemical Building after partial demolition, reuse, and remodeling of the existing structures. The raw sewage pumping station and headworks facilities will be designed to handle the ultimate peak flows expected without expanding the structures. The initial pump installation will include pumps that are capable of handling the peak flows with one pump out of service. As flows increase, additional pumps will be added as necessary, so that there will always be the capacity to pump the peak flows with one pump out of service.

The headworks will consist of fine screens and vortex grit chambers. The screening facilities will be designed to handle peak flows with one unit out of service and additional screens will be added as necessary as flows increase. Initially, one vortex grit chamber designed to handle peak flows will be constructed with a bypass channel.

Other headworks equipment additions and modifications will occur as part of Phases 2 and 3 of RWRP Expansion.

6.b.2.3 New Primary Clarifiers

As part of Phase 1, one new circular primary clarifier, approximately 120 feet in diameter, will be installed west of the existing second stage aeration basins to remove suspended solids and related biological oxygen demand (BOD). The clarifier will receive grit basin effluent and will be covered with a dome for odor control. Primary clarifier effluent will feed the aeration basins. Ferric chloride, added to the grit basin effluent, will provide for phosphorus removal and enhance BOD and suspended solids removal.

Primary sludge will be pumped from the primary clarifiers to the existing blend basin and mixed with waste activated sludge prior to anaerobic digestion. Scum and other floating material will be removed from the surface. The scum from each clarifier will flow into a common pit from the scum trough at the periphery of each clarifier and then be pumped from the scum pit directly to the anaerobic digesters.

One additional primary clarifier will be added as part of Phase 2, with a third new primary clarifier possibly added as part of Phase 3 (Figure 6-2).

6.b.2.4 Aeration Basins with Process Air Blowers and Odor Control

As part of Phase 1, two new covered aeration basins will provide stabilization of the primary effluent and ammonia removal. The basins will receive primary effluent from the primary clarifiers, return activated sludge from the final clarifiers, and mixed liquor recycle from the effluent end of the basin. Effluent from the aeration basins will be conveyed to the final clarifiers. The aeration basins will operate in parallel. The new aeration blowers, to be located in a new Blower Building to be constructed over the aeration basins, will provide low pressure process air to the aeration basins. Odor will be controlled by the use of basin covers and treating process air, plus an allowance for sweep air, in two packed tower scrubbers using a chlorine solution.

Two more aeration basins will be added as part of Phase 2, and two more as part of Phase 3 (Figure 6-2).

6.b.2.5 Final Clarifiers with Return Activated Sludge and Waste Activated Sludge Pumps

As part of Phase 1, one new, approximately 120-foot diameter, circular final clarifier will be installed, designed for a peak effluent flow of 12 mgd, with chemical addition. The new clarifier will be located south of the new aeration basins and will receive mixed liquor recycle from the aeration basins. The final clarifier effluent will flow to the chlorine contact basins. Alum and/or polymer can be added to the mixed liquor recycle flow to the final clarifier, for additional phosphorus removal and enhanced suspended solids removal. Return activated sludge will be pumped from the final clarifier to the aeration basins to support the biological population. A portion of the return activated sludge will be pumped to the blend tank, as with waste activated sludge, prior to the anaerobic digestion. Secondary scum will be removed and sent directly to anaerobic digesters.

An additional final clarifier will be added as part of Phase 2, with a third new final clarifier added as part of Phase 3 (Figure 6-2).

6.b.2.6 New Gravity Belt Thickeners

There are currently two gravity belt thickeners at the RWRP. A third gravity belt thickener will be installed as part of ongoing upgrade improvements prior to the RWRP Expansion. One new gravity belt thickener will be installed as part of Phase 1, and a second as part of Phase 2, to augment the existing gravity belt thickeners. The existing centrifuge thickened sludge tanks will be retained for use with the gravity belt thickeners.

6.b.2.7 Addition of New Dry Polymer Make-up and Feed System

A second dry polymer system will be installed to feed polymer to the gravity belt thickeners. The second system will allow for the use of different polymers for thickening activated sludge and digested sludge. The use of two different polymers will optimize gravity belt thickening and polymer use, resulting in cost-savings through reduced polymer consumption and the production of thicker sludges. It also doubles polymer feed capacity and provides redundancy. The new dry polymer system will be installed in the existing dry polymer room.

6.b.2.8 New Sludge Storage Tanks

A new thickened, digested sludge storage tank with approximately 2.5 million gallons of capacity and a sludge pumping station will be constructed north of the anaerobic digesters. This tank, along with the existing storage tank, will provide capacity to initially store approximately six months of digested sludge. Additional storage tanks will be built in this area as plant loads increase (Figure 6-2).

6.b.2.9 Ancillary Facilities

A truck loadout facility will be added as part of Phase 2. It will be enclosed to control dust and odor.

6.b.2.10 Potential Impacts

Review of the RWRP Expansion Project Area indicates that construction of the proposed expansion will result in the following:

- Minor surface-water drainage modifications potentially resulting in wetland impacts and related Section 404 of the CWA, WCA, and Public Waters permitting.
- Dewatering of excavations during construction.
- Tunneling, including bedrock tunneling, during construction.
- Noise and dust during construction.
- Increased heavy equipment traffic during construction.
- Erosion potential during preliminary site grading and site construction.
- Increased impervious area and resultant need for stormwater management.
- Excess soil, bedrock, and demolition debris generated by the project will be managed in accordance with applicable environmental regulations.
- The evaluation of the aesthetic benefits of visual screening of the expanded facility from 37th Street.

6.b.3 Trunk Sewer Extension

This EAW also addresses the cumulative potential effects of related or anticipated future projects, per Minn. R. ch. 4410.1700, subp. 7B. The RWRP Expansion will substantially increase the capacity of the RWRP, and the City's ability to serve future residential, commercial, and industrial growth in the area. The trunk sewer extensions addressed in this EAW will serve future growth areas, enabling development. These future growth areas will be served by new trunk sewers installed west of the Douglas Trail for the westernmost portion of the watershed serving Kings Run consisting of approximately 2,700 acres; north of 55th Street and west of 18th Avenue serving the Northwest Territory covering 7,703 acres; and east of the Zumbro River serving Hadley Valley covering 6,307 acres, for a total of 16,710 acres (Figures 5-3 through 5-5). However, this EAW addresses potential secondary development and cumulative impacts associated with 21,914 acres. An additional 5,204 acres lie within the sewershed covered by the Kings Run Area Sewer Replacement Project EAW (July 2003) and is included in the discussion of secondary development impacts located in the infill areas within this sewershed.

The trunk sewer extensions are in the planning stages, but the conceptual alignment corridors (including possible alternatives) are shown on Figures 5-3 through 5-5 within their related sewersheds. Although these conceptual alignments are described in the following text, final alignments will be refined within the identified corridors as the final design process progresses. The phases of proposed trunk sewer extension and anticipated construction timing are presented below. These trunk sewer extensions all have estimated capacities in excess of one mgd and should serve development that could occur through 2035 or later. For purposes of this EAW, it was assumed that secondary development would occur by 2035, even though much of it could occur by 2045 or later.

6.b.3.1 Kings Run

Phase 6 (2006-2008 construction): Phase 6 is shown on Figure 5-3. The alignment of the Kings Run Area Sanitary Sewer Replacement Project that was addressed in an earlier EAW (July 2003) and existing interconnecting trunk sewer lines are also shown. Phase 6 will start at the Douglas Trail, one-half mile east of 60th Avenue NW, and will follow the Douglas Trail until it intersects with 65th Street NW. Phase 6 will be

gravity sewer and will be constructed using standard trench and fill construction methods. Phase 6 will be approximately 4,400 feet long. A 500-foot wide conceptual alignment corridor for this phase is shown on Figure 5-3, it is estimated that a 100-foot construction easement will be required.

6.b.3.2 Northwest Territory

Phase 5A (2006-2008 construction): Phase 5A (Figures 5-3 and 5-4) will extend from the Kings Run sanitary sewer (Figure 5-3), and will then proceed northeast approximately 1,250 feet until it reaches the intersection of 18th Avenue NW and 55th Street NW. The conceptual alignment for Phase 5A Alternative 1 will then proceed north along the western side of 18th Avenue NW until it reaches 75th Street NW for about 10,500 linear feet. Two other possible alternative alignments- (5A Alternative 2A and 5A Alternative 2B, also shown on Figures 5-3 and 5-4) will extend from the western terminus of the earlier Kings Run sanitary sewer and will then proceed northwest for approximately 6,000 to 8,000 linear feet before heading northeast for approximately 5,000 linear feet. Two alternative construction methods are being considered for construction of this conceptual alignment segment and alternatives. The first is a gravity flow alternative that would use micro-tunneling methods in bedrock to minimize impacts to surface resources and the second is to use standard trench and fill construction methods in association with force main from a pump station constructed in the vicinity of 75th Street NW and 18th Avenue NW. The construction method used will be ultimately decided by results of an economic and geotechnical analysis. Phase 5A will be approximately 12,000 feet long.

Phase 5B (2007-2009 construction): Phase 5B (Figure 5-4) will start at the northern terminus of Phase 5A and branch off into several segments. Conceptual alignment segment 5B1 will be installed first to serve Sewer Service Area 30B and will start on the northern terminus of Phase 5A, described above, and will follow the north side of 75th Street NW for approximately 500 feet to where it will cross under 75th Street NW heading southwest and will follow a tributary of the South Fork of the Zumbro River for approximately 10,060 linear feet to its terminus. Segment 5B1 will be approximately 10,600 feet long.

A second conceptual alignment, segment 5B2, will be constructed to ultimately serve Sewer Service Areas 30A, 30C and 30D. Segment 5B2 Alternative 1 will start on the northern terminus of Phase 5A and will then head northwest for approximately 9,700 linear feet, and will then head west for approximately 2,500 linear feet to Trunk Highway (TH) 52. This segment may be constructed either as a gravity flow sewer using micro-tunneling methods or as a force main requiring a second pump station in the vicinity of TH 52 and 85th Street NW. The construction method used will be ultimately decided by results of an economic and geotechnical analysis. Segment 5B2 Alternative 2 will start at the northern terminus of Phase 5A and follow 18th Avenue NW for approximately 5,300 linear feet, then head west along 85th Street NW for about 8,000 linear feet, and then head northwest along TH 52 for about 1,400 linear feet to a pump station in the vicinity of TH52 and 85th Street NW. Segment 5B2 Alternative 2 will be constructed as a force main in the road rights of way, requiring the pump station.

A third conceptual alignment, segment 5B3, will be constructed to serve Sewer Service Area 30A and 30C. It will connect to Segment 5B2 approximately 500 feet west of TH 52 and will then head south until it crosses under 85th Street NW, where it will head southwest for approximately 6,200 linear feet following a tributary of the South Fork of the Zumbro River. Segment 5B3 will be gravity sewer and will be constructed using standard trench and fill construction methods. Segment 5B3 will be approximately 7,700 feet long.

A fourth conceptual alignment, segment 5B4, will serve Sewer Service Area 30A and begin at the end of segment 5B2 on the west side of TH 52. Segment 5B4 will then continue southwest along a tributary for the South Fork of the Zumbro River and will end approximately 1,700 feet west of 60th Avenue NW. Segment 5B4 will be gravity sewer and will be constructed using standard trench and fill construction methods. Segment 5B4 will be approximately 11,300 feet long.

A 500-foot wide conceptual alignment corridor for this phase is shown on Figures 5-3 and 5-4. It is estimated that a 100-foot construction easement will be required where standard trench and fill construction methods are used, and only very limited surficial disturbance will occur if micro-tunneling methods are used.

6.b.3.3 Hadley Valley

Phase 4A (2004-2006 construction): Phase 4A (Figure 5-5) will start approximately 300 feet east of the eastern terminus of the new siphon installed as part of the earlier Kings Run sanitary sewer project and will then continue on the north side of 37th Street NW for approximately 1,500 feet, then cross under East River Road Northeast (NE) and continue north along the east side of East River Road NE for approximately 4,500 feet. This section will be constructed using standard trench and fill construction methods, however, a portion of this segment may be constructed using micro-tunneling methods in bedrock (Figure 5-5). A 500-foot wide conceptual alignment corridor for this phase is shown on Figure 5-5, it is estimated that a 100-foot construction easement will be required where standard trench and fill construction methods are used, and only very limited surficial disturbance will occur if micro-tunneling methods are used.

Phase 4B (2006-2007 construction): Phase 4B (Figure 5-5) will start on the northern terminus of Phase 4A and will continue northeast along the southern side of Hadley Valley Creek for approximately 3,000 feet, will then cross under TH 63 and terminate on the south side of 48th Street NE. Phase 4B will be gravity sewer and will be constructed using standard trench and fill construction methods. A 500-foot wide conceptual alignment corridor for this phase is shown on Figure 5-5. It is estimated that a 100-foot construction easement will be required.

Phase 4C (2008-2010 construction): Phase 4C (Figure 5-5) of the sanitary sewer conceptual alignment has two alternative routes. Segment 4C Alternative 1 will start at the eastern terminus of Phase 4B and will then cross over to the north side of 48th Street NE before heading east along 48th Street NE and ending two miles west of County State Aid Highway (CSAH) 11. Segment 4C Alternative 2 will also begin at the eastern terminus of Phase4B, will then cross under 48th Street NE and follow Hadley Valley Creek to the east to where it will end two miles west of CSAH 11. Either alternative will be gravity sewer and will be constructed using standard trench and fill construction methods. Phase 4C will be approximately 15,000 to16,500 feet long. A 500-foot wide conceptual alignment corridor for this phase is shown on Figure 5-5. It is estimated that a 100-foot construction easement will be required.

6.b.3.4 Construction Methods and Potential Impacts

For the majority of the project, standard trench, and fill construction methods will be used. These methods will result in the disturbance of surface conditions as a result of excavation and stockpiling of excavated soil and materiel (supplies). All reasonable efforts will be made to restore the ground surface in a context-sensitive manner. Where appropriate to subsurface conditions, trench collars will be used to prevent significant alteration of ground-water flows. A significant portion of Phases 5A and 5B may alternatively be constructed using micro-tunneling methods through bedrock (Figures 5-3 and 5-4). This will minimize impacts to surface resources with the exception of the tunnel portals on each end and at intermediate access shafts. Excess soil, bedrock, and demolition debris will be generated by the project; these materials will be managed in accordance with applicable environmental regulations.

Review of the Project Area indicates that construction of the proposed RWRP Expansion and related trunk sewer extensions will result in the following:

- Temporary impacts to wetlands and public waters.
- Limited conversion of wooded areas.
- Temporary impacts to park and recreation areas.
- Dewatering of excavations at some locations during construction.

- Acquisition of easements from businesses and residences.
- Noise and dust during construction.
- Temporary traffic impacts during road crossings.
- Erosion potential during construction.

6.b.4 Potential Cumulative and Secondary Impacts From Both Projects

The proposed land use for the area within the Kings Run, Northwest Territory, and Hadley Valley sewersheds is urban residential and commercial/industrial development. The timing of urbanization will vary according to the demand for housing, commercial and industrial property, the intention of local developers, and the availability of infrastructure. The consequences of this enabled development are varied and multiple. Change of land use from farmland, with some open space and wildlife habitat, to urban neighborhoods is the most apparent.

This, in turn, will result in alterations of species types and numbers. Increased impervious surfaces can cause the generation of greater volumes and discharge rates of stormwater runoff, which if not properly managed, can cause erosion and water quality degradation. Increased populations will lead to an expanded transportation infrastructure, which if not properly planned and executed, could result in traffic congestion and vehicle-related air emissions. Increases in demand on other infrastructure, including schools, police and fire protection, utilities, such as gas, water, and power, will also occur with development. The means of avoiding, minimizing and mitigating environmental impacts associated with development are well understood. Development of areas adjacent to the City is accomplished by voluntary annexation petitions by property owners and by Orderly Annexation Agreements between the City and adjacent townships as described in the following paragraph. For this reason, development of the area will be subject to compliance with the City's comprehensive plan, including land use, sewer, recreational, and stormwater management plans, along with their associated land development ordinances.

Olmsted County's Land Use Plan and Zoning Ordinance limit the type of residential development possible within the USAs and URAs. Properties located in the 25-year USA, which will have municipal services available within 10 years cannot develop unless annexation occurs. Properties within the 25-year USA that will not have municipal services available for more than 10 years can develop as an "interim development." This type of development will ensure that future connections and transitions to municipal jurisdiction will occur as smoothly as possible. Properties within the 50-year URA can also develop as an "interim development" as long as an Orderly Annexation Agreement has been reached between the township and municipality.

6.c. Project Purpose

Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The purpose of the City's expansion of the RWRP and the installation of new trunk sewer extensions is to provide municipal sewer service to future growth areas of the City. Project beneficiaries include property owners, who will receive improved sanitary sewer service, and the City, which will have improved sewer system capacity, improved treatment capability, and the ability to collect and treat sewage from future growth areas. There is also a water quality benefit to the region. Failing septic systems and unsewered communities account for 52 percent of dry weather fecal coliform flows in impaired rivers in southeast Minnesota (*Regional Total Maximum Daily Load Evaluation for Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin*, MPCA, August 2002; *Regional Total Maximum Daily Load – Study of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin Implementation Plan,* MPCA, October 15, 2003). The extension of trunk sanitary sewer will provide existing residences with failing septic systems and future residences the opportunity to connect to City sewer.

6.d. Future Stages

Are future stages of this development including development on any outlots planned or likely to happen?

☐ Yes ☒ No

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

The project will provide increased RWRP wastewater treatment capacity and future trunk sewer connections to serve future growth areas that do not currently have sanitary sewer service. These areas include the westernmost portion of the Kings Run sewershed and the Northwest Territory and Hadley Valley sewersheds. The environmental impacts and the cumulative/secondary impacts resulting from development in the service areas for these future trunk sewer connections are addressed under 6.b.4-Potential Cumulative and Secondary Impacts For Both Projects.

The City has a long range facility location master plan for providing wastewater treatment at the current RWRP location with treatment capacity beyond that proposed for the three phases discussed in this EAW.

6.e. Staging

Is this project a subsequent stage of an earlier project? ☐ Yes ☒ No

If yes, briefly describe the past development, timeline and any past environmental review.

The project is not a subsequent stage of an earlier project. However, it is related to the Kings Run Area Sanitary Sewer Replacement Project that was addressed in an earlier EAW, because the sizing of the Kings Run Area replacement sewer pipes considered the eventual installation and use of the new trunk sewer extensions addressed in this EAW. The Kings Run Area Sanitary Sewer Replacement Project EAW was published in the EQB Monitor on July 21, 2003, with the Findings of Fact and Negative Declaration was published in the EQB Monitor on December 23, 2003.

7.0 PROJECT MAGNITUDE DATA

RWRP Expansion

Total Project Area (acres) Proposed Expansion Area is 9.70 acres; Potential Expansion Area is 54.25 acres or Length (miles) NA Number of Residential Units: Unattached NA Attached NA maximum units per building NA Commercial/Industrial/Institutional Building Area (gross floor space): total square feet NA Indicate area of specific uses (in square feet):

Office	NA	Manufacturing	NA
Retail	NA	Other Industrial	NA
Warehouse	NA	Institutional	NA
Light Industrial	NA	Agricultural	NA
Other Commercial (specify)	NA		
Building height	NA		

If over 2 stories, compare to heights of nearby buildings:

Nearby buildings to the west and south are primarily one to two story commercial building, with some residential and institutional buildings along 37th Street NW and further west.

Trunk Sewer Extension and Potential Secondary Development

Total Project Area (acres) Construction impacts on approximately 200 acres (the sewer corridors) affecting potential secondary development in 21,914 acres (the sewersheds) or Length (feet) Approx. 84,200 linear feet of trunk sewer extension

Number of Residential Units: Unattached 33,663 Attached 14,748 Maximum Units per Building NA

Commercial/Industrial/Institutional Building Area (gross floor space): Total Square Feet 23,534,930

Indicate area of specific uses (in square feet):

The following project magnitude data is based on developable land areas and floor area ratio assumptions provided by Rochester-Olmsted Planning Department (ROPD) staff:

Office	9.3 million sq. ft.	Manufacturing	3.6 million sq. ft.
Retail	3.8 million sq. ft.	Other Industrial	1.5 million sq. ft. (sand and gravel)
Warehouse	NA	Institutional	430,175 sq. ft. (social services)
Light Industrial	NA	Agricultural	NA
Other Commercial (specify)	Hotels – 4.8 million sq. ft. or 1,000 rooms		
Other Institutional (specify)	Schools for 5,300 secondary students and 5,000 elementary students, not included in square footage above.		
Building height	Variable		

If over 2 stories, compare to heights of nearby buildings. Existing structures are primarily one and two story homes and businesses.

8.0 PERMITS AND APPROVALS REQUIRED

List all known local, state and federal permits, approvals and financial assistance for the project. Include modifications of any existing permits, governmental review of plans, and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing and infrastructure.

Appendix A contains Tables A-1 through A-4 that list permits and approvals and potential major infrastructure financial assistance sources that may be required for the RWRP Expansion, trunk sewer extension, and secondary development. The City generally requires the creation of a GDP for any property that proceeds through the platting process (subdivision of land) and/or when the property is proposed to change from a lower intensity use to a higher intensity use. The GDP serves as a guide for the development on the roadway networking and sizing, utility routing, drainage patterns and stormwater management, parks and open space, and conceptual land use mix and development intensity. The property owner (Owner) and City staff also use the GDP to determine the broad effects of the development on the property itself, the off-site infrastructure, and the surrounding properties.

The GDP follows a prescribed course of review that includes a series of steps and approvals, including:

- Submittal of the GDP application with all required submittal information
- Owner-initiated neighborhood meeting(s)
- GDP review by City staff
- GDP review by outside agencies
- Rochester Planning and Zoning Commission public hearing
- City Council public hearing

The neighborhood meeting and the public hearings are opportunities for concerned citizens to provide their testimony on the proposed plan prior to the City Council rendering a final determination on the project. The following list identifies the review agencies and the topics they most commonly provide input on to the City Planning Commission and Council:

- ROPD - compliance with all zoning and development standards, including traffic, wetlands, hillside development, and shoreland and floodplain impacts
- Rochester Public Works - road networking, traffic, sizing and routing of public utilities, drainage and stormwater management, and development design
- Rochester Park & Recreation - parkland dedication
- Rochester Public Utilities (RPU) - water and electric service issues and impacts on well head protection areas
- DNR – natural resources impacts, especially wetlands, flooding, shorelands, work in public waters, wildlife and habitat
- Natural Resource Conservation Service (NRCS)/Soil and Water Conservation District - soils, erosion control and drainage issues
- Olmsted County Health Department – public health, safety, and welfare issues
- Olmsted County Environmental Services - ground and surface water quality
- Rochester Committee on Urban Design and the Environment – environmental impact and urban aesthetic design issues

Input collected through the review and public hearing process is used to modify GDPs and to identify approval conditions. Once a GDP is approved, the developer is obligated to return to the Planning and Zoning Commission and the City Council at both the preliminary and final platting stages, both of which require additional public hearings. Table A-3 (Appendix A) lists the many permits and approvals required related to secondary development. Due to the more than 30 years within which development of the area may occur, regulatory and permit requirements pertaining to future development and infrastructure projects will likely change and as new requirements are instituted, they will be applied when applicable.

9.0 LAND USE

Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

9.a Current And Recent Land Use

As Figure 9-1 and Table 9-1 show, about 40 percent of the Project Area has been developed into urban land uses such as residential, commercial, industrial, and institutional uses. As shown in Table 9-2, land uses within the Project Area range from urban to rural. The predominant rural land use is row crop agriculture with some sand and gravel mining. About 13 percent of the rural area is unlikely to be developed due to environmental constraints including water features, floodplains, slopes greater than 26 percent and hydric (wetland) soils.

TABLE 9-1

STATUS OF DEVELOPMENT WITHIN PROJECT AREA

Sewershed	Total Acres	Developed[1] (acres)	Developable[2] (acres)	Constrained[3] (acres)
Kings Run	7,904	4,889	2646	369
Northwest Territory	7,703	1,645	5,538	520
Hadley Valley	6,307	2,206	3,255	846
Total Project Area	21,914	8,740	11,439	1,735

Notes:

1 Developed acres are those with urban land uses such as residential, commercial, industrial, and institutional.

2 Developable acres are those areas with the potential for urban development less constrained areas.

3 Constrained acres are the undeveloped areas where development is constrained by environmental features such as water bodies, floodplains, slopes greater than 26 percent and hydric (wetland)

soils.

Continued growth in Olmsted County has resulted in the ongoing development of previously agricultural uses to various types of urban uses. In general, development is occurring adjacent to existing urban uses and along major transportation corridors following adopted plans and regulations (see response to Question 27). Figure 9-2 shows the current land uses within the Project Area based on Olmsted County Assessor's Codes, analysis of 2002 aerial photography, and discussions with ROPD staff regarding current development plans. The acreage in each type of land use is further summarized in the Table 9-2.

TABLE 9-2
CURRENT LAND USES WITHIN THE PROJECT AREA

Land Use	Total Acres	Developed (acres)	Planned for Development (GDP, acres)	Undeveloped (acres)
Agricultural	13,174			13,174
Commercial	686	683	3	
High Density Residential	105	105		
Industrial	51	51		
Manufactured Home Park	109	109		
Medium Density Residential	147	0	147	
Parks/Open Space	1,196	1,196		
Public Utilities	2	2		
Public/Semi-Public[1]	559	559		
Rights-of-Way	1,321	1,321		
Single Family Residential-Sewered	3,333	1,108	2,225	
Single Family Residential-Large Lot Unsewered	1,231	1,231		
Total Project Area	21,914	6,365	2375	13,174

1 Public/Semi-Public land use represents those uses that are oriented for general public use and generally owned by a public body or not for profit entity/agency. These uses include government facilities, such as government offices, public works garages or facilities; religious institutions, such as churches, mosques or synagogues; educational facilities public or private; and golf courses. The patterns were identified using assessors data and generally include codes in the 900s.

The proposed RWRP Expansion and trunk sewer extension projects are compatible with existing land uses because:

- Expansion of the RWRP will be within the RWRP property boundaries and in an area zoned for that use since it was built in the early 1950s.
- Construction of the proposed sewer line would result in only temporary impacts and would generally not permanently alter the land surface.
- Portions of the sewer line may be constructed using tunneling methods; for these portions there would be little or no alteration of the land surface.
- Property owners will receive improved sanitary sewer service.
- The City will have improved sewer system capacity, improved treatment capability, and the ability to collect and treat sewage from future growth areas.
- The extension of trunk sanitary sewer will provide existing residences with failing septic systems and future residences that will develop in the area the opportunity to connect to City sewer.
- Secondary growth will occur in a manner consistent with adopted land use planning processes.

9.b Potential Environmental Hazards

Known environmental hazards due to the current and/or past land uses are limited because the Project Area is primarily agricultural and residential. One potential contaminant is farm dumps, however none have been identified. In addition, the current industrial and commercial land uses pose the possibility of contamination, although nothing has been identified.

Review of MPCA Leaking Underground Storage Tank (LUST) database revealed two open LUST and 17 closed LUST sites within the Project Area that could have the potential to impact soil and/or ground water (Table 9-3, Figures 9-3 through 9-5):

TABLE 9-3

MPCA LEAKING UNDERGROUND STORAGE TANK SITES

MPCA LUST ID	Map ID[1]	Site Name	Address	Closure Date
765	1	S&S Moving and Storage	6101 Bandel Drive NW	3-18-96
813	2	Hadley Valley School	1925 48th Street NE	12-13-01
4053	3	Zadrow Auto	5300 West River Road NW	6-3-91
5250	4	Adamson Motors Inc.	4800 Highway 52 N	4-6-93
5274	5	MnDOT	2900 48th Street NW	3-20-95
6170	6	Viking Olds Nissan	4646 Highway 52 N	4-19-95
6702	7	Menards	5150 Highway 52 N	8-23-94
7515	8	Tom Kadleck Pontiac	4444 Highway 52 N	1-31-96
9031	9	Shamrock Enterprises	6415 Bandel Road NW	5-1-96
9351	10	Universal Ford Toyota	4900 Highway 52 N	6-13-97
9757	11	Greenway Coop Station	3610 East River Road NE	2-13-98
13999	12	Water Reclamation Plant (RWRP)	301 37th Street NW	Open[2]
12111	13	Tom Cadillac	4444 Highway 52 N	12-16-99
13573	14	Badger Farm	4210 Valleyhigh Road NW	10-02-00
13859	15	Fleet Maintenance Garage	4000 East River Road NE	10-10-02
14135	16	Briese Iron Works	4525 Highway 63 N	Open
13874	17	Target Corporation	3900 Highway 52 N	5-31-01
14133	18	Sargent's Landscape	7955 18th Ave NW	Unknown[3]
11071	19	Oronoco Sanitary Landfill	2633 85th St NW	2-9-98

Notes:

[1] Numbers correspond to site locations shown on Figures 9-3 through 9-5.

[2] RWRP – This site was listed on the LUST database. According to MPCA records, Leak Number 13999 was assigned to the site in July 1998 for a release of fuel oil. According to RWRP personnel, a fuel oil tank was removed at the site, but there was no release of petroleum. RWRP staff are coordinating with MPCA staff to determine the reason for this discrepancy. This site is not anticipated to impact RWRP Expansion or trunk sanitary sewer extension activities.

[3] To simplify mapping and discussion, this site has been tallied as a closed site.

LUST site No. 2 (Figure 9-5) is along the proposed trunk sewer corridors in the Hadley Valley sewershed. Site 18 (Figure 9-4) is located along a proposed trunk sewer corridor in the Northwest Territory. The MPCA will be contacted prior to the final design for these trunk sewer segments regarding the status of these sites and associated design and construction considerations, in particular the potential for the migration of ground-water contamination or methane into and along the sewer collection system.

In addition, the MPCA databases revealed four sites within the Project Area that could have the potential to impact soil and/or ground water.

Former Rochester Sanitary Landfill/Lagoon Site – This site is located in Cascade Township 107N, Range 14W, North ½ of Section 14. It is part of the RWRP property (Figures 9-3 and 9-5). This site was listed on the MPCA database under the Comprehensive Environmental Response, Compensation, and Liability Information System. The City enrolled the site into the MPCA Voluntary Investigation and Cleanup (VIC) Program to address potential contamination issues associated with three adjacent waste areas: the 1950 east landfill cell, the

1960 west landfill cell, and the sewage sludge lagoons storage area. As part of the closure project, waste from the 1950 east cell and stabilized sewage sludge from the adjacent sewage sludge storage lagoons were added to the west landfill cell before it was capped and equipped with a passive gas venting system and new ground water and gas monitoring networks were installed. This is discussed further under 11.a.1. Ground water and landfill gas investigations have recently been completed to determine the effect of remediation activities. It is anticipated that MPCA VIC Program staff will issue a no action letter to the City after receipt and review of the findings in the near future. The new RWRP sludge storage tanks will be installed were the lagoon was formerly located (Figure 6-1). However, due to the VIC Program action, no negative impacts are anticipated. RWRP Expansion is not located on the east or west landfills, and trunk sewer extension conceptual alignments do not occur in the vicinity of any of the three VIC project areas. As a result, this site is not anticipated to impact RWRP Expansion or trunk sewer extension activities.

Olmsted County Sanitary Landfill (a.k.a. Oronoco Landfill) – This site is located in Olmsted County, T108N, R14W, West ½ of Section 28 in the Northwest Territory sewershed (Figure 9-4, Map ID 19). The Olmsted County Sanitary Landfill waste disposal cells encompass 51.1 acres of a 225-acre property and contains approximately 2,800,000 cubic yards of waste. The Olmsted County Sanitary Landfill was under public ownership when in operation. This site received its first permit to accept waste on February 9, 1970, and continued operating until March 1, 1993, after which it was transferred to the MPCA under the Closed Landfill Program. Prior to the transfer, this was the site of a comprehensive Superfund investigation. As a result of the findings of the Remedial Investigation, the Olmsted County Sanitary Landfill was removed from the state and federal Superfund lists.

In accordance with the legislation enacted in 1992, (Minn. Laws 1992, ch. 513, Art.2, Sec. 2, Subd.3), the MPCA assessed and classified closed landfills in Minnesota. According to that assessment and classification, the Olmsted County Sanitary Landfill was a given a ranking of C and a score of 13. While this classification may be revised annually as needed, the ranking of C indicates that this landfill may require a cover upgrade, minor construction (such as gas vents) and/or future corrective actions. The MPCA is currently installing an active gas extraction system to replace the former passive gas venting system. The Environmental Monitoring System includes 19 monitoring wells and 12 gas-monitoring probes. Of these, four wells are located in an up gradient direction, fourteen are down gradient, and one is side gradient. Trunk sewer extension conceptual alignments run along the southern boundary of the landfill property but a half-mile south of the waste cells. The MPCA will be contacted prior to the final design for these trunk sewer segments regarding the status of these sites and associated design and construction considerations, in particular the potential for the migration of ground-water contamination or methane into and along the sewer collection system. Secondary development could occur in the vicinity, as consistent with regulatory requirements.

Universal Ford LUST Site – This site is located in Olmsted County, T107N, R14W, North ½ of Section 16 at 4900 Highway 52 North in Rochester (Figure 9-3). The site is listed as a VIC program site. The 5-acre site is currently inactive. Universal Ford has been an automobile dealership since about 1975. In May 1996, three 200-gallon Underground Storage Tanks that had been used to store paint solvents were excavated from the north side of the site along with eight cubic yards of contaminated soil. The solid was thermally treated at the CleanSoils facility. An investigation of the vicinity detected benzene, toluene, and trichloroethylene (TCE) in ground water at concentrations near the Health Risk Levels (HRLs). Subsequent ground-water investigations have been conducted. Recent sampling indicates that TCE remains above the HRL in two monitoring wells, while the other contaminant levels have decreased. No contaminants associated with the solvent release were detected in ground water on the downgradient edge of the site, except for low levels of chloroform. Based on these results the consultant concluded that the paint solvent impacts to ground water were limited to the former tank basin area and recommended that no further investigation be conducted and that the MPCA staff issue a no action letter. Based on a review of the site documents, the MPCA staff agreed with the consultant's recommendation that no further investigation or remediation is necessary at the site. Trunk sewer extension conceptual alignments do not occur in the vicinity of the site. Secondary development could occur in the area, as consistent with regulatory requirements.

Rochester Sand and Gravel Demolition Debris Landfill – This site is located in Olmsted County, T107N, Range 14W, North ½ of Section 14, on the northeast side of the South Fork of the Zumbro River across from the RWRP property (Figure 9-5). This site is listed as a Permitted Solid Waste Site. The site was opened and a MPCA Solid Waste Permit was issued in the mid-1980s. The landfill accepted construction debris and demolition-derived wastes. Hinderman Enterprises, Inc., currently owns the site and MPCA personnel (December 2003) confirmed that the site will be issued a closure letter by the end of 2003. A trunk sewer extension conceptual alignment runs along the east edge of the Rochester Sand and Gravel property, including the demolition debris landfill site. The trunk sewer alignment will follow along the road right- of-way and this site is not anticipated to impact trunk sewer extension activities. However, due to the site's proximity to the conceptual alignment, the MPCA will be contacted prior to the final design for these trunk sewer segments regarding the status of these sites and associated design and construction considerations, in particular the potential for the migration of ground-water contamination or methane into and along the sewer collection system. Secondary development could occur in the area, as consistent with regulatory requirements.

Leitzen Block Plant – This site is located in Olmsted County, T107N, R14W, Northeast ¼ of Section 23; south of 37th Street NW and east of 3rd Avenue NW (in the southeast quadrant of this intersection) (Figures 9-3 and 9-5). This site entered the VIC program in November 2003. The 1.5-acre site is located in a general commercial district and historical use includes concrete block manufacturing, construction site service support, and an auto sales lot. Part of the site is wooded and was previously used as a demolition/mixed debris dump adjacent to the South Fork of the Zumbro River. Initial geoprobe work at this site has found only p-Isopropyltoluene at 116.8 ug/kg at a depth of about 20 feet below ground surface. More investigation is pending.

Due to the September 11, 2001, terrorist action and resulting changes in data availability, maps from the Office of Pipeline Safety showing the locations of liquid and natural gas pipelines are made available only to emergency responders. However, Gopher One will be contacted to locate pipelines as part of the construction associated with the RWRP Expansion, trunk sewer extensions, and as required by developers working within the area.

10.0 COVER TYPES

Estimate the acreage of the site with each of the following cover types before and after development:

RWRP Facility Expansion - Proposed Expansion Area

	Before	After		Before	After
Types 1-8 wetlands	0.5	0.4	Lawn/landscaping	3.0	1.4
Wooded/forest	1.1	0.1	Impervious Surfaces	4.9	7.7
Brush/grassland	0	0	Other (describe)	0.2	0.2
Cropland	0	0			
			TOTAL	9.7	9.7

Trunk Sewer Extension (100-foot construction corridor only)

	Before	After		Before	After
Types 1-8 wetlands	0.3	0.3	Lawn/landscaping	20.9	20.9
Wooded/forest	18.1	0	Impervious Surfaces	3.7	3.7
Brush/grassland	28.7	46.8	Other (describe)	1.0	1.0
Cropland	109.3	109.3			
			TOTAL	182	182

ROPD's 1999 Geographic Information System (GIS) coverage of the Minnesota Land Cover and Classification System (MLCCS) was used to estimate impacts to vegetation and cover types. The classification system has approximately 100 cover types that were combined to fall under the seven cover classifications identified in this question. There are some minor inaccuracies both in the collection and interpretation of MLCCS data both due

to its regional scale and a reliance on aerial photograph interpretation with limited ground verification, and in the combining of multiple cover types under the seven cover classifications in this question. However, even with these minor limitations, the MLCCS provides a good basis for cover and vegetation analysis.

Figures10-1 through 10-3 show natural resources including threatened and special concern species and cover types (e.g., forest/woodland, developed (impervious), grassland/shrubland, lawn/landscaping, cropland, wetland, and other). The impervious surfaces cover type is shown as developed land on the legend for Figures 6-2 and 10-1 through 10-3. Figures 10-4 through 10-6 show surface water features, including watercourses, wetlands, lakes, floodplains, and other related features. Figure 9-1 shows existing development patterns. Current development, natural resource constraints, and developable acres are discussed under the response to Question 9. Specific changes in acreages of cover due to development cannot be specifically predicted until GDPs are submitted. The primary change would consist of cropland being converted to more urban uses, followed to a lesser degree by conversion of brush/grassland and forest areas.

Loss of woodlands where buildings or structures will be installed at the RWRP Expansion site and directly above trunk sewer line extensions will be permanent. Trees lost during construction that are not located directly above the trunk sewer line extensions will be allowed to re-colonize. Upland forest takes longer than floodplain or lowland forest to recover. In the interim, these areas will be considered brush/grassland and reseeded with context-sensitive vegetation.

Wetland acreage totals may not be representative of actual site conditions. The MLCCS mapped the drainage ditch immediately east of the first phase of RWRP Expansion (Figure 6-2) as wetland. The National Wetland Inventory (NWI) mapping does not identify this area as wetland. In addition, a wetland report prepared for the City as part of the Former Rochester Sanitary Landfill/Lagoon Site VIC project (Rust 1998) was used to evaluate wetland impacts. Refer to the Response to Question 11 for more detailed information regarding wetlands.

Note that the 182-acre total shown here for trunk sewer extension corridor is less than the 200-acre total provided in the response to Question 7. As can be seen in the figures various alternative trunk sewer extension alignments are proposed. For purposes of cover evaluation alignments with the greatest natural vegetation and cropland impacts were selected to respond to this question because the longer routes which have a higher total acre disturbance are largely located in road rights-of way with less long-term impact to cover and landscape. Also, both MLCCS wetlands and NWI mapping were used to estimate impacts to wetlands for the RWRP Expansion and trunk sewer extension.

Potential Secondary Development

	Before	**After[1]**		**Before**	***After**
Types 1-8 wetlands	124		Lawn/landscaping	3,127	
Wooded/forest	3,218		Impervious Surfaces	1,020	
Brush/grassland	3,312		Other (describe)	282	
Cropland	10,831				
			TOTAL	21,914	21,914

[1] In the absence of specific GDPs, actual acreages of cover after secondary development occurs cannot be specifically predicted. The primary change would consist of cropland, being converted to more urban uses. To a lesser degree, brush/grassland and forest areas face potential conversion.

MLCCS data rather than the NWI mapping was used to estimate the acres of wetland within the Project Area, because the NWI mapping for the area missed several sections and would tend to underestimate potential wetland area. As a result, the MLCCS data presents higher and more representative estimate of wetland acres.

11.0 FISH, WILDLIFE, AND ECOLOGICALLY SENSITIVE RESOURCES

Identify fish and wildlife resources and habitats on or near the site and describe how they will be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

11.a.1 Rochester Water Reclamation Plant Expansion – Potential Expansion Area

The land cover in the RWRP potential expansion area is a mixture of mostly impervious surface (developed) land and lawn/landscaping (Figure 6-1). The proposed RWRP Expansion area for the current three-phase project, consists primarily of impervious surface (developed) and land, lawn/landscaping, with some wooded/forest, wetland, and other cover (Flood Control Project rip-rap). The cover types that make up the area and their sizes were calculated from the MLCCS, as described in the response to Question 10 above.

Figure 6-2 presents the site plan for the proposed three-phases of RWRP Expansion. Since the proposed RWRP Expansion area is adjacent to existing commercial, industrial, or other disturbed areas, including the RWRP, the Flood Control Project, and the remediated sludge lagoon and landfill sites, there is little undisturbed wildlife habitat present.

Project development would result in the permanent habitat conversion of approximately 1 acre of woodland/forest, 1.6 acres of lawn/landscaping, and 0.1 acres of a drainage ditch identified as wetland cover to impervious land. Impacts to "urban" wildlife species using these converted areas will be permanent requiring them to relocate to other areas and compete with other individuals of their species. Smaller species may be forced to relocate and compete with other individuals of their species. Larger species may be forced to relocate to portions of their territories that are not impacted. Seasonal activities, such as nesting or mating, may be disrupted or curtailed, depending upon the season of construction. An exception to this will be the resident goose population that currently uses the open areas north and east of RWRP. Since they also use the 29-acre closed landfill area and the 24-acre soccer complex northwest of the RWRP, they are unlikely to be stressed by the loss of the north and east areas.

Wetlands represent the most ecologically sensitive habitat in this area. The MLCCS information pertaining to wetlands in the potential RWRP Expansion area shows approximately 4.15 acres of wetlands. Approximately 3.65 acres of the wetland cover type shown on Figure 6-1 were associated with the RWRP's former sewage sludge lagoon. The sludge lagoon was also mapped as wetland on the NWI mapping. Wetland identification, verification, and delineation for portions of the property were conducted in association with the VIC landfill/sludge lagoon closure project (Rust 1998, see the response to Question 9). Ten distinct areas, including the sewage sludge lagoon, were identified as having wetland characteristics. Based on wetland delineations and coordination with the ROPD as the Local Governmental Unit under the WCA and the USACE under Section 404 of the CWA, approvals for wetland replacement plans and exemptions for the VIC project were obtained for each jurisdictional wetland area. As part of the landfill closure, sewage sludge from the lagoon was stabilized, excavated, and placed in the adjacent landfill prior to capping and closure. A summary of site wetland permits/approvals associated with the VIC project are as follows.

- The USACE agreed that seven of the ten wetlands on the site, including the sewage sludge lagoon, were not subject to USACE jurisdiction. The VIC work disturbing three wetlands located on the floodplain adjacent to the Zumbro River was authorized under a Nationwide Permit.
- The ROPD approved No-Loss Exemption certificates for eight of the ten wetlands. A replacement plan was approved for the remaining wetlands impacted by the VIC project, which involved the creation/enhancement of a wetland area in the northeast portion of the site, adjacent to the South Fork of the Zumbro River. The wetland mitigation site is located outside of the potential RWRP Expansion area, and will not be impacted by the RWRP Expansion.

The remaining 0.5 acres identified as wetland cover in the MLCCS mapping is a drainage ditch (Figure 6-1). This area was not mapped as wetland on the NWI mapping and was outside of the area where delineations were

conducted for the VIC project. As a nontidal drainage ditch, the area may not be considered a water of the U.S. and would be exempt from USACE Section 404 permit requirements. The area may be considered a jurisdictional wetland under the WCA criteria, if it meets specific hydric soil, hydrology, and hydrophytic vegetation requirements.

11.a.2 Trunk Sanitary Sewer Extension

One of the purposes of this project is to provide the sanitary sewer infrastructure to serve new growth areas in the westernmost portion of the Kings Run sewershed, and the Northwest Territory and Hadley Valley sewersheds. The land cover along the proposed sanitary sewer conceptual alignments is shown on Figures 10-1 through 10-3. The trunk sewer construction phases are shown in Figures 5-3 through 5-5 and the current land cover in these areas are discussed in the responses to Question 10. Short-term impacts of construction on area wildlife include the disruptive effects of construction, as discussed in reference to the RWRP Expansion.

Wetlands represent the most ecologically sensitive habitat in this area. Based on MLCCS and NWI mapping, trunk sewer extension is estimated to impact about 0.3 acres of wetland. This number may change based on the actual alignments based on final design and the field identification, verification, and delineation of wetlands. Sequencing of wetlands pursuant to the WCA will be observed (see Section 12.c.). In areas where construction within wetlands cannot be avoided, the wetlands will be restored to pre-construction grades and vegetation will be re-established to maintain habitat.

11.a.3. Secondary Development/

11.a.3.1 Wildlife Habitat Introduction

There is a variety of wildlife in the Project Area due to the diverse types of habitat available. Wetlands, woodlands, grasslands/shrublands, and croplands found in the area provide cover and habitat for many common species of plants and animals found in the upper Midwest. Long-term impacts on area wildlife due to the trunk sewer extension will be more extensive. The project is being constructed to provide sanitary sewer infrastructure to future residential, commercial, and other development within the service area in accordance with long-range land use plans. With increased urbanization of the sewersheds, both the diversity and the populations of existing species will likely decline. Remnant populations of existing wildlife may also be isolated from other populations, and normal migration patterns will be disrupted. Mammals, reptiles, and amphibians will be killed by increased traffic or forced to relocate by habitat alteration. Long-term changes in species diversity and population sizes will be an unavoidable consequence of development. Ultimately, indigenous wildlife throughout the service area will be replaced by wildlife more typical of residential areas. Wooded/forest habitat directly above the sewer lines will be largely converted to brush/grassland habitat on a permanent basis. Floodplain and lowland forest in temporary easements will recover with time. In the long term, the ability of the area to support wildlife will be diminished. The frequency of conflicts between humans and wildlife will increase in the form of nuisance wildlife complaints.

11.a.3.2 Wetlands

Wetlands were identified using the MLCCS and NWI mapping. NWI mapping did not cover some sections of the Project Area, so MLCCS data was used to estimate wetland acreages within the Project Area. There are approximately 124 acres of wetlands within the entire Project Area. This is comprised of about 17.7 acres within the Kings Run sewershed, 16.3 within the Northwest Territory sewershed, and 89.9 within the Hadley Valley sewershed. The wetland cover mapped within the Project Area is shown on Figures 10-1 through 10-3. These wetlands provide habitat for numerous waterfowl (e.g., ducks, geese, cranes), amphibians, reptiles, and upland wildlife species.

Recently, a calcareous fen (fen) was identified in the NE ¼ of the NW ¼ of Section 19, T107N, R13W. As a fen, the wetland is considered an Outstanding Resource Value Water. The DNR has approved a Fen

Management Plan prepared by the Developer. Long-term compliance with the Fen Management Plan is a condition in the Development Agreement between the City and the Developer.

11.a.3.3 Watercourses

Kings Run, the South Fork of the Zumbro River, and Hadley Valley Creek are DNR Public Waters that run through the Project Area (Figure 10-1 through 10-3). In addition, there is a portion of an intermittent, unnamed waterway located north of 85th Street NW that is also designated a DNR Public Water. The portion of the unnamed waterway designated as a Public Water begins east of TH 52 and continues in a northeasterly direction to its confluence with the South Fork of the Zumbro River. Kings Run is located in the west central portion of the Project Area and runs east along 55th Street NW until it drains to the South Fork of the Zumbro River. The South Fork of the Zumbro River is located in the central portion of the Project Area and runs north along West River Road NW. Hadley Valley Creek is located in the east central portion of the RWRP Expansion area and runs west along 48th Street NE until it drains to the South Fork of the Zumbro River. All other drainageways shown as rivers or streams on Figures 10-4through 10-6 are intermittent.

Portions of Kings Run, the South Fork of the Zumbro River, and Hadley Valley Creek corridors are wooded and provide habitat for upland wildlife and migratory birds. Migratory birds, amphibians, reptiles, and waterfowl are common types of species found along creeks. The dominant land use along the South Fork of the Zumbro River is agricultural with some scattered industrial and commercial landscaping. The dominant land use along Hadley Valley Creek and the unnamed waterway is also agricultural row crops with some interspersed wooded areas and associated wetlands. Today, the eastern two-thirds of the Kings Run watershed is primarily urbanized, while the western third is agricultural. Along most of its length, Kings Run is ditched, although in some sections, pools, riffles, and meanders have become established.

11.a.3.3.1 Kings Run

The sewer replacement alignment follows the basic course of the Kings Run corridor and will cross Kings Run several times. Following construction of the sewer, pre-construction grades and context-sensitive vegetation will be re-established. The *Rochester Surface Water Management Plan* included natural resource information collected in 1997 on the Kings Run corridor, which is replicated below.

Natural Communities

The original vegetation of the Kings Run corridor was prairie in the upper and middle sections and oak savanna in the lower sections near the junction of Kings Run and the South Fork of the Zumbro River. The majority of the prairie has now been converted to agricultural land. Most of the oak savanna has succeeded to oak forest or has been cleared for agriculture.

The upper portion of the Kings Run corridor contains small tracts of oak forest in the vicinity of the Douglas Trail. Most of these upland forest areas occur as linear strips along the old railroad right-of-way, which is now part of the Douglas State Trail System. The land immediately adjacent to the creek itself, in both the upper and middle sections of the corridor, is occupied by a narrow band of lowland hardwood forest dominated by box elder (*Acer negundo)*, eastern cottonwood (*Populus deltoides)*, and willow (*Salix exigua)*. Disturbance by agricultural activities and invasion by exotic species is significant due to the small size and linear shape of these communities. For these reasons, the quality of the forested natural communities in the upper and middle reaches of the corridor is low. Forest in the lower portion of the corridor is of good quality and includes mesic oak forest in areas of higher ground.

Most wetland natural communities in this corridor have been altered through drainage and/or invasion by Reed canary grass (*Phalaris arundinacea)*. Other areas that were once open wetlands, such as wet meadows, have probably succeeded to the lowland hardwood forest communities that are now common along the creek channel.

Wildlife

Some of the most common wildlife species observed in Kings Run Corridor include beaver, raccoon, mink, pheasant, and deer. Due to the small size, linear shape, and overall poor quality of natural communities in the upper and middle portions of the Kings Run corridor, only habitat generalist species of wildlife, such as deer, are likely to be found. Furbearers, such as beaver, mink, and muskrat that travel within the creek itself, were present at the time the corridor was field inspected (Bonestroo, Rosene, Anderlik, and Assoc. 1997). These species will continue to be present as long as some natural vegetation is maintained along the creek. The lower portion of Kings Run is contiguous with the South Fork of the Zumbro River and contains higher quality natural communities and better wildlife diversity. Overall, Kings Run does not have high habitat value due to the poor condition and lack of natural communities.

Fisheries

No fisheries information was available for the Kings Run corridor. Presumably, many of the smaller minnow-like species found in other small streams (fathead minnows, shiners, and suckers) outletting into the South Fork of the Zumbro River will also be present in the lower portions of Kings Run.

Endangered, Threatened, Rare, and Sensitive Resources are discussed in the response to Question 11.b.

11.a.3.4 Lakes

Although several open water areas created by mining activities and occur along the Zumbro River, none of them are formally classified as lakes in the City's GIS system. Potential impacts to Lake Zumbro related to RWRP discharge is addressed under the response to Question 18.b.

11.a.3.5 Woodland/Forest Areas

Olmsted County land use mapping and the MLCCS information was used to classify and map woodland areas. Woodland/forest areas comprise approximately 3,218 acres of the Project Area. Several forest stands occur throughout the Project Area. The woodlands provide habitat areas to wildlife species as previously described.

11.a.3.6 Brush/Grassland

Olmsted County land use mapping and the MLCCS information was used to classify and map brush/grassland areas. Brush/grassland areas comprise approximately 3,312 acres of the Project Area. Similar to agricultural/croplands, the brush/grassland areas provide habitat areas to wildlife species previously described.

11.a.3.7 Agricultural/Cropland

Olmsted County land use mapping and the MLCCS information was used to classify and map agricultural/cropland areas. Agricultural/cropland areas comprise approximately 10,831 acres of the Project Area.

The agricultural and cropland areas provide nesting habitat, cover, and food for wildlife. Small and medium sized mammals utilize these lands, including white-tailed deer, raccoons, red and gray fox, woodchuck, squirrel, and other small mammals. Song and game birds may also be present throughout the Project Area and include a variety of edge, open, and woodland species. Prime and unique farmland is discussed in Question 25.b.1.

11.a.3.8 Impervious Land

Olmsted County land use mapping and the MLCCS information was used to classify and map impervious land areas. Impervious land areas comprise approximately 1,020 acres of the Project Area, primarily roadways, parking areas, and buildings associated with development.

11.a.3.9 Lawn/Landscaping

Olmsted County land use mapping and the MLCCS information was used to classify and map lawn/landscaping areas. Lawn/landscaping areas comprise approximately 3,127 acres of the Project Area.

11.a.3.10 Other

Olmsted County land use mapping and the MLCCS information was used to classify and map remaining natural resource areas as "other" areas. Other areas comprise approximately 282 acres of the Project Area. Areas classified as other were land classifications that didn't fit into any other category. The classifications were areas of 0 to 50 percent impervious cover with exposed earth, sand and gravel pits with 0 to 50 percent impervious cover, mines with 0 to 10 percent impervious cover, and other exposed/transitional land with 0 to 10 percent impervious cover.

11.a.3.11 MnDNR Scientific and Natural Areas

The Oronoco Scientific and Natural Area (SNA) is located within the Northwest Territory sewershed. It is located along the west side of County Road 112 and just east of TH 52 (Figure 10-2). This area is addressed under section 11.b.1.3 - Northwest Territory.

11.a.4 Potential Habitat Impacts

The conversion of open land, agricultural land, woodland, grassland, shrubland, and wetlands to urban development will disturb the habitat and feeding areas, and affect current wildlife species. Runoff impacts are addressed in the responses to Questions 16 and 17. The contiguous habitat corridor associated with the watercourses may become more fragmented by development in the Project Area. Presently, development and infrastructure design plans are largely unknown for properties within the Project Area. Due to the unknown nature of future development within the Project Area, the specific extent of impacts on wildlife and natural resources is not fully known. Alternative site design to help to maintain areas for natural habitat are supported by the subdivision design policies as identified in the *Rochester Land Use Plan.* Additionally, the *Rochester Surface Water Management Plan* and its subsequent reports and addenda encourage a stream corridor concept to retain natural channels and their associated natural features for their water quality protection and stormwater conveyance benefits.

11.b Endangered, Threatened, Rare, and Sensitive Resources

Are any state (endangered or threatened) species, rare plant communities or other sensitive ecological resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site? ☒ Yes ☐ No

If yes, describe the resource and how it will be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the DNR Natural Heritage and Nongame Research program has been contacted give the correspondence reference number. ERDB 20040267

Describe measures to minimize or avoid adverse impacts.

11.b.1 State Natural Heritage Program

The DNR Natural Heritage Program (NHP), data was obtained from the DNR and is included in Figures 10-1 through 10-3. Also, a coordination letter was sent to the DNR Natural Heritage and Nongame Research Program. A copy of the response letter is located in Appendix A.

Secondary development enabled by the project, could have potential impacts on six threatened and four special concern species. The ten natural heritage recorded wildlife species that occur within the Project Area are: the state listed threatened Blanding's turtle *(Emydoidea blandingii*), state listed threatened Timber rattlesnake (*Crotalus horridus*), state listed special concern Hill's thistle (*Cirsium hillii*), state listed threatened Tuberous Indian-plantain (*Arnoglossum plantagineum*), state and federally listed threatened Prairie bush clover (*Lespedza lrptostachya*), state listed threatened Valerian (*Valeriana ciliata*), state listed special concern Rattlesnake-master (*Eryngium yuccifolium*), state listed threatened Elktoe mussel (*Alasmidonta marginata*), state listed special concern Fluted-shell mussel (*Lasmigona costata*), and state listed special concern White wild indigo (*Baptisia alba*). There are no state listed endangered species recorded in the Project Area.

A species is ranked as threatened, if the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Threatened species are protected under the Federal Endangered Species Preservation Act of 1973, as amended in 1978, 1982, and 1988; Minn. Stat. ch. 84.0895; Minn. R. ch. 6134; and the *Olmsted County Plan*. A species is listed as special concern if, although the species is not endangered or threatened, it is extremely uncommon in this state, or has unique or highly specific habitat requirements and deserves careful monitoring of its status. Species on the periphery of their range that are not listed as threatened may be included in this category along with those species that were once threatened or endangered, but now have increasing or protected, stable populations. Special Concern species are not protected under current regulations.

11.b.1.1 RWRP Potential Expansion Area

There are no state or federal listed threatened, endangered, or special concern species recorded in the RWRP Expansion area.

11.b.1.2 Kings Run Sewershed

Blanding's Turtle

The Blanding's turtle *(Emydoidea blandingii)* is a state-listed threatened species associated with sandy soils and a variety of wetland types. The eastern tip of the Kings Run sewershed and the western half of the Hadley Valley sewershed are within a potentially important area for Blanding's turtles. There are 13 such areas in the state, which are considered by the DNR to be priority areas for research and management activities, but for which important information on the size and health of the Blanding's turtle populations is lacking. Because of this lack of information, the exact boundaries of the potentially important areas have not yet been determined. However, due to the widespread development occurring statewide on Blanding's turtle habitat, these areas are becoming increasingly indispensable for maintaining the species' security in the state.

The preferred habitat of the Blanding's turtle includes calm, shallow water, rich aquatic vegetation and sand uplands for nesting. Studies by Congdon *et al.* (1983), in Michigan and by Linck in Massachusetts have shown that nesting females may travel considerable distances (200 to 400 meters) to a nesting area, passing enroute what appears to be suitable nesting habitat immediately adjacent to the marsh in which they reside (Coffin and Pfannmuller 1988).

Blanding's turtles need both wetland and upland habitats to complete their life cycle. The loss of wetland habitat through drainage or flooding to convert wetlands into ponds or lakes, loss of upland habitat through development or conversion to agriculture, human disturbance (including collection for pet trade, road kills during seasonal movements), and increases in predator populations (skunks, raccoons, etc.) that prey on nests and young all contribute to a decline in this species.

In long-lived species, protecting the adults is critical to any conservation strategy. A female turtle may produce as many as 500 eggs during her life. Losing many of these long-lived females, through habitat loss or direct mortality, will seriously jeopardize the ability of a population to maintain itself. One of the potential threats is mortality while crossing roadways. Roadway design with large culverts or tunnels may provide an alternative route for turtles, but requires further evaluation to refine design and effectiveness (Lang 2000).

Construction projects that adversely impact wetlands in areas identified as Blanding's turtle habitat could destroy critical overwintering habitat for Blanding's turtles. In addition, wetland and upland areas are important during various Blanding's turtle life stages. If these habitat areas are destroyed or substantially altered, Blanding's turtle will be extirpated from the area. River and stream crossings by wastewater trunk sewer extensions, if not properly managed, may result in the mobilization of sediments and subsequent adverse siltation of their habitat.

A fact sheet is included in Appendix A, which provides information about the Blanding's turtle. The fact sheet provides background information regarding habitat use, life history, and reasons for the species' decline, as well as recommendations from these fact sheets for avoiding and minimizing impacts to this rare turtle. There are two lists of recommendations that are included in. Appendix A contains recommendations to prevent harm to turtles during construction work, and is relative to all areas inhabited by Blanding's turtles. Greater protective measures are identified in the fact sheet for areas known to be of statewide importance to Blanding's turtles. Because the eastern tip of the Kings Run sewershed and the western half of the Hadley Valley sewershed are within a potentially important area for Blanding's turtles, the lists of recommendations on both lists apply to these areas. These recommendations will be considered during the design of the trunk sewer extensions and as other City infrastructure, such as roads and other utilities, is extended into the area. These recommendations will also be considered as part of the City's GDP review process. The City will make the referenced flyer available to both contractors and developers working in the area. It contains an illustration and description of the Blanding's turtle, as well as a summary of the recommendations provided in the fact sheet.

Timber Rattlesnake

The Timber rattlesnake (*Crotalus horridus*) is a state-listed threatened species. A 1990 record for Timber rattlesnake occurs within the Kings Run sewershed. This record indicated that one snake was found in a tire and there were reports that snakes had been observed on the farm sunning themselves. A review of the geologic map for the area indicates that this siting occurred in an area where 18 to 25 percent slopes are present and bedrock outcrops occur.

During the summer months the Timber rattlesnake inhabits deciduous forests, croplands, and bottomlands along river valleys (Coffin and Pfannmuller 1988). In the spring and fall, Breckinridge (1944) and Vogt (1981) have found Timber rattlesnakes frequenting steep, rugged bluffs, rock ledges and outcrops near overwinter dens (Coffin and Pfannmuller 1988).

Minnesota's rattlesnake population decreased because people killed them to collect a bounty (reward offered by counties). Other people took them as pets. Also, trees and shrubs grew up on bluff prairies, giving snake-eating raptors a place to perch. In recent years, the DNR has tried to help rattlesnakes with controlled burns on bluff prairies that kill shrubs and trees. Rattlesnake bounties were eliminated in 1989. To help protect the Timber rattlesnake from systematic destruction, efforts should be made to preserve river bottomland habitats and den sites.

Construction projects that adversely impact river bottomland habitats or steep, rugged bluffs, and rock ledges and outcrop den sites could affect adversely affect Timber rattlesnakes. Areas temporarily impacted by sewer construction will be returned to pre-construction conditions so that impacts to bottomland habitats would be minimized. This habitat information will be considered by the City in relation to secondary development as part of the GDP review process.

Mussels

The South Fork of the Zumbro River flows along the border of the Hadley Valley and Kings Run sewersheds. Several rare mussel species including the Elktoe mussels, a threatened species, and Fluted-Shell mussels, a special concern species, have been documented in this river. Freshwater mussels are declining nationwide and have been described as one of North America's most imperiled groups of animals. In Minnesota 25 of the 48 native mussel species are listed as either endangered, threatened, or of special concern. The primary reasons behind the decline are the degradation of lakes and rivers as a result of runoff and physical changes such as damming, channelization, and dredging. The Elktoe mussel has a very limited distribution and is in danger of extirpation in the Zumbro River and its tributaries. Mussels are particularly vulnerable to deterioration in water quality, especially increased siltation.

The Elktoe mussel originally inhabited many rivers in Minnesota, including the Mississippi, Minnesota, Sunrise and Snake (Dawley 1947). The Elktoe mussel is now common only in the St. Croix River and some tributaries (Heath 1990, Hornbach et al. 1995). It is still found occasionally in the Mississippi (M. Davis personal communication) and Zumbro Rivers of southeastern Minnesota, where Bright et al. (1988) considered it a minor component of the mussel fauna. Bright et al. (1990) considered it to have been a minor component of the Mississippi River fauna historically, and is now apparently on the verge of extirpation in Minnesota (Bright et al. 1990, 1995).

Small numbers of the Fluted-shell mussel (*Lasmigona costata*) live in medium-sized rivers statewide. This mussel lives in sand, mud, or fine gravel in medium to large rivers where the flow of water is slow to moderate. The elongated shell has obvious wavy ridges on one end and can grow seven inches long (Mississippi National River and Recreation Area Web site 2001, and Kelner 2000).

Mitigation in the form of effective erosion and sediment control practices will be implemented and maintained throughout the RWRP Expansion project and the installation of trunk sewer extensions. As described in the *Stormwater Plan* and required by ordinance, the City will require the construction of sedimentation basins and, where applicable, piping to collect, convey, and provide erosion and sediment control for stormwater as new development occurs. Stormwater management is discussed under the response to Question 17. City and state erosion control permits and approvals are listed in Table A-3 (Appendix A) and erosion and sedimentation are addressed in the response to Question 16.

11.b.1.3 Northwest Territory

An area identified by the Minnesota County Biological Survey as a "Site of High Biodiversity Significance" is located at the northern tip of the Northwest Territory sewershed (Figure 10-2). Such sites are areas with varying levels of native biodiversity that may contain high quality native plant communities, rare plants, rare animals, and/or animal aggregation. Biodiversity significance is evaluated on the basis of the number of rare species, the quality of the native plant communities, size of the site, and context within the landscape. This particular site contains some of the best prairie habitat remaining in Olmsted County. The dry prairie remnants are in very good condition, have excellent species diversity, and support several rare plant species including Prairie Bush Clover, a federally and state listed threatened species, Tuberous Indian Plantain, a threatened

species, and Hill's thistle and Rattlesnake-master, both special concern species. Because more than 99 percent of the prairie that was present in the state before settlement is no longer present, and more than one-third of Minnesota's endangered, threatened, and special concern species are now dependent on the remaining small fragments of Minnesota's prairie ecosystem, the DNR believes that all prairie remnants merit protection.

None of the conceptual trunk sewer extension alignments under consideration will impact the area of recorded protected species locations in the vicinity of the area of high biodiversity. Minnesota SNA are given the highest level of protection and the utmost consideration in assessing potential impacts from nearby projects. The Site of High Biodiversity Significance encompasses about 182 acres and is adjacent to the 80-acre Oronoco Prairie SNA. Secondary development will be limited to some degree by the Oronoco Prairie SNA that incorporates approximately 17 acres of the "Site of High Biodiversity Significance." The Oronoco Prairie SNA is located along the west side of County Road 112 and just east of TH 52 (Figure 10-2). SNAs are legally designated public nature preserves established to protect the state's rarest natural features and sensitive resources. Five rare plant species occur on the dry prairies of Oronoco Prairie SNA. An 80-acre kame and its gravelly outwash make up the west end of the site, suited for the oak savanna found there. Dry gravel prairie and bedrock bluff prairie comprise the western portion of the site, with shards of limestone bedrock mixed abundantly through the soil. Prairie dropseed, sideoats grama, little bluestem, porcupine grass, big bluestem, Indian grass, and two species of panic grass are found on hilltops and steep slopes that characterize this prime bedrock bluff prairie. Shallow, limestone-rich soils harbor valerian, one of the five rare species found here. On the north side of the bluff prairie, near its base, rare white wild indigo is present. The biggest concentrations of tuberous Indian plantain and Hill's thistle, both rare, are found on the dry gravel prairie at the west end of the site. Rattlesnake master, at its northernmost range here, is scattered throughout. In danger of vanishing in Minnesota, these rare prairie plants distinguish this top-quality prairie (DNR response letter and Web site 2003). Information pertaining to each of these rare plants and their habitat is included in this section.

As shown in Figure 10-2, the northern edge of the Olmsted County Landfill (a.k.a. Oronoco Landfill) spans the eastern portion of the "Site of High Biodiversity Significance". This property is owned by the state of Minnesota and administered by the MPCA under the Closed Landfill Program. Under this program, the MPCA is required to develop a land management plan that should include provisions to manage the state and federal protected species on its property. Also shown on the figure, Shamrock Enterprises owns the quarry operation that covers most of the remainder of the "Site of High Biodiversity Significance" that falls within the Project Area. The very small area that occurs outside of the Oronoco SNA, Oronoco Landfill, and Shamrock Enterprises Quarry and within the Project Area is part of a large agricultural parcel that is located largely outside of the Project Area.

Tuberous Indian - Plantain

The Tuberous Indian - plantain (*Arnoglossum plantagineum*) is a state-listed threatened plant species. Historical records indicate that the Tuberous Indian - plantain was not formerly rare in Minnesota but has suffered a recent decline paralleling the nearly total conversion of its prairie habitat. It normally occurs in very low densities. Consequently, the small remnant habitats that survive today have preserved few individual plants and may be incapable of supporting viable populations (Coffin and Pfannmuller 1988).

In Minnesota the Tuberous Indian - plantain is restricted to native, mesic prairie in the southeastern portion of the state; the Minnesota River Valley appears to have functioned as an effective barrier to northward migration. The Tuberous Indian - plantain seems to have little tolerance for disturbance and is not found in areas that have a history of cattle grazing, herbicide application, or repeated haying. Consequently, the small remnant habitats that survive today have preserved few individual plants and may be incapable of supporting viable populations (Coffin and Pfannmuller 1988).

Prairie Bush Clover

The Prairie bush clover (*Lespedza lrptostachya*) is a state and federally listed threatened plant species. At one time this distinctive prairie legume may have been abundant, but is now one of the rarest plants in the Midwest. The reason for the decline is the extensive loss of prairie habitat since the time of settlement, which has caused numerous extirpations and a severe contraction of the range. The result is that there are only a handful of scattered populations isolated in remnant habitats. These remnants have persisted because they were too rocky or steep for agricultural use. However, recent advances in agricultural technology have made these marginal lands more economical to convert to cropland, so habitat loss will continue (Coffin and Pfannmuller 1988 and *Prairie Bush Clover, a Threatened Midwestern Prairie Plant, Minnesota Department of Natural Resources, no date*).

This species occurs in the dry, gravelly hill prairies and in thin soil prairies over granite bedrock. It shows a distinct preference for north-facing slopes. Commonly associated species include big bluestem (*Andropogon gerardi)* and Indian grass (*Sorghastrum nutans)* (Coffin and Pfannmuller 1988).

Valerian

The Valerian (*Valeriana ciliata*) is a state-listed threatened plant species. This long-lived perennial was not formerly rare in Minnesota, but the nearly total destruction of prairie and fen habitats has reduced the species to a few isolated colonies. In Minnesota, it is experiencing a second and more threatening decline that could eliminate 80 percent of the remaining populations within the next ten years. The losses will be greatest among populations occurring in prairies and railroad rights-of-way. These prairie strips have long been unavailable for agriculture and have served as *de facto* sanctuaries for many native species. Recently, however, railroad companies have been abandoning many rail lines and selling the rights-of-way. These rights-of-way, and the prairies that occur on them, are typically bought by adjacent landowners and converted to crop production (Coffin and Pfannmuller 1988).

This species appears to require a moist, sunny, calcareous habitat. This includes fens, meadows, and mesic prairies. In the Paleozoic Plateau of extreme southeastern Minnesota, the species occurs in thin soil on exposed limestone bluffs. This habitat superficially appears to be quite different from then more typical habitats, but it seems to provide the same requirements of moisture, sunlight, and pH (Coffin and Pfannmuller 1988).

Rattlesnake-Master

The Rattlesnake-master (*Eryngium yuccifolium*) is a state-listed plant species of special concern that is basically a species of prairie habitats. The species is most abundant in the Midwest, and it reaches the northern limit of its range in the Minnesota River Valley. It was indeed a common and characteristic plant of the mesic prairies in southern Minnesota, but loss of habitat since the time settlement has led to a 99 percent decline. The only populations surviving today occur in small remnant habitats, mostly prairie strips on railroad rights-of-way. The Minnesota populations show no ability to adapt to human-created habitats and occur only in undisturbed native habitats. The species is particularly susceptible to cattle grazing and herbicide application (Coffin and Pfannmuller 1988).

Hill's Thistle

Hill's thistle (*Cirsium hillii*) is a state-listed plant species of special concern that typically prefers dry, sandy or gravelly soils in prairies, savannas, and open woods. It is sometimes considered a subspecies of *Cirsium pumilum* (Nutt.) Spreng., which is a more easterly species. It is also closely related to and often confused with *C. drummondii* of the arid Great Plains. However, the Midwestern populations appear to represent a distinct entity. There are numerous records of this species in Minnesota, but few are recent, indicating it is not nearly as common as it once was. This decline appears to be widespread. The decline is owing to a general loss of

habitat resulting from the conversion of prairies to agricultural production. The Hill's thistle populations in Minnesota are largely restricted to habitats in the transition zone between the major forest and prairie biomes (Coffin and Pfannmuller 1988).

White Wild Indigo

White wild indigo (*Baptisia alba*) is a state-listed special concern species that is a native legume of the prairies in southeastern Minnesota. When settlers first arrived, it was apparently a common species. As the prairies were plowed, this species began a steep decline. The greatest losses occurred soon after the turn of the century. Today, less than one percent of the original habitat is believed to survive. Surviving populations exist in a few small isolated remnant prairies that are still threatened (Ownbey, G.B. and Morley, T 1991).

11.b.1.4 Hadley Valley

As discussed under 11.b.1.2 Kings Run, the western half of the Hadley Valley sewershed and the eastern tip of the Kings Run sewershed within a potentially important area for Blanding's turtles. The related impacts and mitigation measures are described in the referenced section.

As discussed under 11.b.1.2 Kings Run, the South Fork of the Zumbro River flows along the border of the Hadley Valley and Kings Run Project Areas. Several rare mussel species including Elktoe mussels and Fluted-shell mussels have been documented in the river. The related impacts and mitigation measures are described in under the mussels heading above in Section 11.b.1.2 Kings Run Sewershed.

11.b.2 U.S. Fish & Wildlife Service

The United States Fish and Wildlife Service (USFWS) was contacted regarding the presence of federally listed threatened and endangered species. A letter was received from the USFWS indicating that three federally threatened species are documented to occur in Olmsted County: the Bald eagle (*Haliaeetus leucocephalus),* Leedy's roseroot (*Sedum integrifolium spp. Leedyi)*, and Prairie bush clover. The Prairie bush clover has been found at two locations within the Project Areas as described under 11.b.3 Northwest Territory. The bald eagle is widespread throughout Canada and the United States. In pre-settlement times bald eagles nested throughout Minnesota, including along the large prairie rivers and the bigger lakes in the southern half of the state. A statewide survey in 1986 located 266 occupied territories of which 187 (72 percent) were successful. The preferred habitat for the bald eagle includes lakes and rivers in forested areas where large trees are available for nesting. The nest trees are usually within 0.8 kilometer of water and or often closer. In Minnesota, red and white pines in the supercanopy are often selected (Coffin and Pfannmuller 1998). A copy of the USFWS response letter is located in Appendix A.

The Prairie bush clover locations are included in the DNR NHP information discussed in the previous section.

Leedy's roseroot is a federally threatened cliffside wildflower, recorded as occurring in only six locations in two widely separated states, Minnesota and New York. Four populations of several thousand plants each are located in Fillmore and Olmsted Counties, Minnesota. None of these recorded populations occur in the RWRP Expansion area, and none were noted in the DNR NHP database. Very specific habitat conditions are required for this plant to occur. Minnesota populations occur on a special habitat called a "maderate" cliff, characterized by the presence of cracks in the rocks, extending from the cliff face to cold underground caverns. Roseroot seems to prefer areas where cool air from the caves comes to the cliff surface through these crack. The caves often connect above ground and uphill with sinkholes. In both New York and Minnesota, these cliffs support a variety of other rare species, including Whitlow grass (*Draba arabisans*), a wild member of the mustard family.

In Minnesota, the cliffs also harbor two newly discovered rare snails of the genus *Navisuccinea*, believed to be dependent on the cool local habitat. The majority of Leedy's roseroot populations occur on privately owned land. Only one of the Minnesota recorded populations occurs on public land, in the Whitewater Wildlife Management Area (Sather1993).

Leedy's roseroot occurs on nearly vertical exposed carbonate bluffs, which are generally absent from the Project Area. Additionally, the *City of Rochester Code of Ordinances* regulates development on bluffs and steep slopes. Bluffs are typically considered to consist of slopes greater than 18 percent and steep slopes are typically those with slopes greater than 12 percent and less than 18 percent. Development is not recommended or is described as poorly suited on steep slopes and not allowed within a specified distance from bluffs unless appropriate design or construction methods are approved.

Bald eagles have been observed conducting transient feeding on the South Fork of the Zumbro River, but no nesting or roosting sites were identified in the DNR information.

12.0 PHYSICAL IMPACTS ON WATER RESOURCES

Will the project involve the physical or hydrologic alteration (dredging, filling, stream diversion, outfall structure, diking, and impoundment) of any surface waters such as a lake, pond, wetland, stream or drainage ditch? ☒ Yes ☐ No

If yes, identify water resource affected. Describe alternatives considered and proposed mitigation measures to minimize impacts. Give the DNR Protected Waters Inventory (PWI) number(s) if the water resources affected are on the PWI.

12.a Area Waters

Kings Run, South Fork of the Zumbro River, and Hadley Valley Creek are DNR public waters that run through the Project Area (Figure 10-4 through 10-6). There is also a portion of an unnamed waterway located north of 85th Street NW that is also designated a DNR public water. The portion of the unnamed waterway designated as public waters begins east of TH 52 and continues in a northeasterly direction to its confluence with the South Fork of the Zumbro River. Kings Run is located in the west central portion of the Project Area and runs east along 65th Street NW until it drains to the South Fork of the Zumbro River. The South Fork of the Zumbro River is located in the central portion of the Project Area and runs north along West River Road NW. Hadley Valley Creek is located in the east central portion of the Project Area and runs west along 48th Street NE until it drains to the South Fork of the Zumbro River. These water resources, as well as their related floodplains, minor tributaries, and wetlands are located within the Project Area.

12.a.1 RWRP Expansion

The RWRP Expansion will not require a new effluent outfall for RWRP discharge. New permit limits have been negotiated as a package that will result in seasonally variable limits based on mass loading requirements. An intermittent drainage way located immediately south of the RWRP will need to be rerouted farther south to the 37th Street right-of-way ditch, and will require a new outfall, but will not alter the composition of the stormwater discharge. Indirect water quality impacts are discussed under the response to Question 18, and erosion control during construction under the response to Question 16.

12.a.2 Trunk Sewer Extension

Review of general water resource data, NWI data, and the DNR Public Waters Inventory indicates that the trunk sewer extension will have temporary impacts on Kings Run, Hadley Valley Creek, and the South Fork of the Zumbro River, and on wetlands associated with these watercourses. NWI, hydric (wetland) and floodplain soils, floodplain mapping, and Public Waters data are presented in Figures 10-4 through 10-6. MLCCS cover mapping is presented in Figures 10-1 through 10-3.

The sewer replacement project could have an estimated 13 stream crossings, 3 of which appear to cross Public Waters. These crossings will have minor impacts to several ephemeral dry runs. Reasonable efforts will be made to minimize impacts to these Public Waters including appropriate erosion/sedimentation control methods and restoration of the riverbed and shoreland areas. All construction activities in Public Waters will be conducted in accordance with DNR Public Waters permit and Utility Crossing license requirements.

12.a.3 Secondary Development

Without required stormwater management techniques, development in the Project Area, including roadway crossings, could impact surface waters and wetlands through increased stormwater runoff. Stormwater management methods are addressed under Question 17. No other impacts to surface-water bodies are anticipated.

Presently, specific development and infrastructure design plans are largely undefined for future development within the Project Area. Further, the determination of the boundaries of floodplains, shorelands, and wetland delineations on properties within the area will not occur until development projects are proposed or plans for roadway extensions or modifications are submitted to the City as part of the GDP review process. Thus, specific physical impacts on water resources related to development are not known but are subject to regulation at such time that they will occur. Most underground utility installations that require stream or wetland crossings will be temporary and the resources will typically revert to their pre-construction state.

12.b Comprehensive Wetland Management Plan

A *Comprehensive Wetland Management Plan (Wetland Plan)* was prepared for the City in 1997 and is used as a source of technical information. The need for the *Wetland Plan* was identified during the development of the *Stormwater Plan*.

The *Wetland Plan* prioritizes wetlands based on their functional values and recommends holistic management of the wetland system. The system-wide view of the *Wetland Plan* includes identification of significant wetland corridors and complexes and opportunities for banking and restoration.

In some instances the *Wetland Plan* recommends protection for adjacent upland resources that provide valuable ecosystem support to a wetland. Since all wetlands do not provide equal values and functions, a wetland inventory incorporated in the *Wetland Plan* establishes priorities for protection. The *Wetland Plan* applied the following wetland management classifications (unique, natural, ecosystem support, and urban):

- The unique wetlands classification is used for wetlands that exist in a largely unaltered state and have special and unusual qualities that call for a high level of protection.
- Natural wetlands have remnant plant communities that are in a largely unaltered state and typically show little sign of impact from surrounding land usage. The vegetative communities of these wetlands are characterized by a diversity of plant species with a mixed dominance of certain species.

- Ecosystem support wetlands have usually been altered by human activities, and may be perceived as low quality systems with little value. However, inventories and assessments indicate that these areas have important values related to upland ecosystems that surround them, or they provide linkage and/or drainage to other systems.
- Urban wetland systems have been significantly altered through past disturbances. They are different from ecosystem support wetlands because they are isolated and do not provide the same ecosystem support to other systems. Many of these wetlands have had their hydrology altered and manipulated by agriculture or urban activities and are in an isolated setting.

The *Wetland Plan* can be used in conjunction with future development proposals as a source of technical information to:

- Provide wetland inventory, assessment, and management information.
- Improve City administration of the WCA by providing sequencing and varied replacement standards based on the functional values of the wetland and resulting management classifications.
- Enhance wildlife values of wetlands.
- Provide and enhance recreational values.
- Designate wetland mitigation banking areas and potentially identify opportunities for mitigation credits from buffer areas.
- Protect wetlands and adjacent resources that provide valuable ecosystem support.
- Protect wetlands from stormwater impacts based on their stormwater sensitivity.

The *Wetland Plan* included the identification of potential wetland banking sites. There are no potential wetland banking sites located within the RWRP Expansion site. Two potential wetland banking sites are located within the Kings Run Trunk Sewer Extension Area, one is located within the Hadley Valley Trunk Sewer Extension Area, and none are located within the Northwest Territory Trunk Sewer Extension Area (Figures 10-4 through 10-6). The following paragraphs provide additional detail about each potential wetland banking project, should future funding be made available for their creation.

Potential wetland banking site KR-1b is approximately 63 acres and is located within the Kings Run Trunk Sewer Extension Area along the north and south sides of Douglas Trail. Since the Wetland Plan was published, a series of stormwater ponds have been constructed on this site.

Potential wetland banking site KR-2b is approximately 18 acres and is located within the Kings Run Trunk Sewer Extension Area and currently serves as a stockpile site for material that was excavated for past construction of the Kings Run Channel. The site is adjacent to wetlands KR-w1.16.1 and KR-w1.19.1. Approximately 1,070 acres drain through this banking area from the south. Most of this drainage comes into the site from the southern tributary of Kings Run. Existing watershed land uses are dominated by agricultural land uses with most of these areas proposed to be in residential development in the next 10 to 15 years. The contributing area consists of farmland that could be developed within the next 10 to 15 years. A golf course currently exists south of the channel and does not have significant water quality treatment prior to entering the Zumbro River. The objectives for this potential wetland banking site are to: 1) restore wetland area adjacent to the creek; 2) provide rate control of stormwater runoff; 3) provide water quality treatment for golf course runoff; and 4) increase aesthetics by removing stockpiled material. The proposed wetland construction would consist of shallow emergent marsh and wet meadow wetlands created on either side of the creek. Water quality and quantity ponding would be provided upstream of the banking area.

Potential wetland banking site HV-1b is approximately 180 acres and is located within the Hadley Valley Trunk Sewer Extension Area. Hadley Valley Creek currently flows along the north side of 48th Street NE. This channel section is extremely degraded and significantly under capacity. Field observation indicated that a portion of the creek once drained through an area approximately 500 feet north of the existing channel. It appears that runoff to the original creek has been diverted into the roadside ditch, causing the ditch to be under capacity and more susceptible to erosion. The original creek channel and adjacent wetlands have been replaced

with agricultural fields. There are no existing wetlands located by the NWI within this site. Like headwater reaches of other streams in the Rochester Area, most of the watershed consists of steep topography with well-developed drainage systems. Land use in the watershed is a mixture of forest on steep slopes and farmland in the lower or upper flat areas. Very little upstream ponding is present in this watershed, although some ponds have been constructed by berming up the downstream end of drainageways. Several stormwater ponds are proposed within southern drainage subdistricts to control peak flow rates and highly erodible soils of the watershed. The watershed for HV-1b encompasses approximately 2,698 acres. About 70 percent of the watershed draining into this banking site is outside the URA. The downstream channel of Hadley Creek is generally in poor condition due to erosion and sedimentation. Sedimentation in some sections of the channel has significantly reduced conveyance capacity, exacerbating potential flooding problems, particularly in the vicinity of 48th Street NE. The potential wetland banking site objectives for this site are to: 1) restore the original channel of Hadley Creek; 2) reduce peak flow rates; 3) remove sediment and phosphorus; and 4) restore a riparian wildlife travel corridor. The proposed wetland construction would consist of the restoration of the original creek and the adjacent wetlands. The channel should be remeandered to simulate the original channel conditions as much as possible. This area would likely be restored to a wetland complex of floodplain forest, emergent marsh, and wet meadow areas.

12.c Protection and Mitigation

Tables A-1 through A-3 (Appendix A) list the permits that are anticipated to be required for the various aspects of the project. Protection of water resources and mitigation of potential impacts to water resources include implementation of the following regulatory programs:

U.S. Army Corps of Engineers (USACE) Section 404 of the Clean Water Act (CWA): Establishes a program to regulate the discharge of dredged and fill material into waters of the U.S., including wetlands. Activities in waters of the U.S. that are regulated under this program include fills for development, water resource projects (such as dams and levees), infrastructure development (such as highways), and conversion of wetlands to uplands. Under Section 404 of the CWA,, the U.S. Environmental Protection Agency (USEPA) and the USACE regulate the placement of fill into all waters of the U.S. Provisions of Section 404 of the CWA are implemented by the USACE with guidance and review by the USEPA. The USFWS provides technical oversight.

Minnesota Wetland Conservation Act (WCA): To retain the benefits of wetlands and reach the legislation's goal of no-net-loss of wetlands, WCA requires anyone proposing to drain or fill a wetland to: 1) try to avoid disturbing the wetland; 2) to minimize any impact on the wetland; and, 3) to replace any lost wetland acres, functions, and values. Certain wetland activities are exempt from WCA, allowing projects with minimal or temporary impacts or projects located on land where certain pre-established land uses are present to proceed without regulation.

The Section 404 CWA and the WCA permitting processes will be required for wetland impacts resulting from RWRP Expansion, installation of trunk sewer extensions, and related secondary development. Efforts are made to avoid wetlands identified through use of the NWI database, MLCCS data, hydric soil mapping, and wetland delineation information. If wetlands cannot be avoided, construction techniques that minimize wetland impacts will be evaluated. Such techniques may include the use of trench boxes to minimize excavation widths, pipe-jacking in difficult locations to eliminate the need for excavation, trench collars to sustain appropriate ground-water flow, or other construction methods. The combination of avoidance, minimization, and mitigation is referred to as *Sequencing*, and this process will be employed during construction projects. Since the trunk sewer installation will result only in the temporary disruption of wetlands during construction, mitigation will

consist solely of restoration of disturbed wetlands. Restoration techniques may include segregation and reuse of surficial hydric soils, restoration of pre-existing grades and establishment of quality wetland species through appropriate seeding/planting and aftercare. The City is committed to the restoration of wetlands temporarily impacted by utility construction.

Rochester Stormwater Management Plan: This plan, written in 1997, revised in 1999, and updated with subsequent addenda and reports, creates a balance between development and natural resource conservation that meets the needs of individuals, businesses, and the community. The City incorporated aspects of the *Stormwater Plan* policies into the *City of Rochester Code of Ordinances*. Citizens, agencies, developers, and industry work together to implement the *Stormwater Plan* and to collectively manage growth by creating developments that accomplish surface water quality and quantity management goals. This includes a reduction of physical impacts by controlling stormwater runoff rates to pre-development conditions.

Minnesota Department of Natural Resources Public Waters Program includes all Type 3, 4, and 5 wetlands (as defined in USFWS Circular No. 39, 1971 ed.) that are 10 acres or more in size in unincorporated areas or 2.5 acres or more in size in incorporated areas (see Minn. Stat. § 103G.005, subd. 17b, Wetland Type) as well as crossings of public waters.

Minnesota Department of Natural Resources State Floodplain Management Act (Minn. Stat. ch. 103F) promulgates minimum standards for floodplain management entitled "Statewide Standards and Criteria for Management of Flood Plain Areas of Minnesota" (Minn. R. 6120.5000 - 6120.6200). These standards have two direct applications: 1) all local floodplain regulations adopted after June 30, 1970, must be compliant with these standards; and 2) all state agencies and local units of government must comply with Minnesota Regulations in the construction of structures, roads, bridges or other facilities located within floodplain areas delineated by local ordinance. Local floodplain regulatory programs, administered by county government (predominately for the unincorporated areas of a county) and by municipal government (for the incorporated areas of a county), must be compliant with federal and state floodplain management standards. Both federal and state standards identify the 100-year floodplain as the minimum area necessary for regulation at the local level. These regulations are intended to protect new development and modifications to existing development from flood damages when constructing within 100-year flood plains cannot be avoided.

DNR Shoreland Zoning, the *County Zoning Ordinance*, and the *City of Rochester Code of Ordinances* all restrict development within 1,000 feet of the ordinary high water mark of lakes and 300 feet of the ordinary high water mark of streams. As with most areas, the exact boundaries for shoreland zoning districts within the Project Area have not yet been determined. In general, land within 300 feet of these Public Water shown on Figures 10-4 through 10-6 that meet the required criteria would be classified and regulated as shoreland. Exceptions to this regulation would require obtaining a conditional use permit from the appropriate agency.

The *City of Rochester Code of Ordinances* provides tools to effect the implementation of water resource conservation and land stewardship concepts. These include regulations prohibiting development in the floodway, requiring conditional use permits for development in the 100-year floodplain, and guiding potential development in shorelands, wetlands, and blufflands areas. The *Rochester Code of Ordinances* also provides restrictions on substantial land alterations. Density bonuses are available to developers who avoid disturbing natural features and provisions are made for cluster subdivisions.

The City also currently requires developers to implement erosion and sediment control measures during development. The *City of Rochester Code of Ordinances* requires new developments to prepare a site Grading and Drainage Plan that will undergo review and approval by a City Engineer prior to issuance of a Grading Permit. Plans typically identify erosion control measures such as temporary sedimentation basins, bale checks, and silt fences to be used during construction. Other references regarding erosion and sedimentation control guidance that are often included in the grading and erosion control plans are extracted from *MPCA Best Management Practices for Protecting Water Quality in Urban Areas* and the *Board of Water and Soil Resources*

Minnesota Construction Site Erosion and Sediment Control Planning Handbook. Post-construction stormwater management is provided through the construction of permanent regional stormwater management facilities.

The MPCA administers the National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permits that will be applicable to any development project one acre or larger that will occur in the Project Area.

DNR Utility Crossing License (Minn. Stat. § 84.415) requires that a license be obtained from the DNR for the passage of any utility over, under or across any state land or public waters. Public waters are any water bodies (lakes, rivers and some wetlands) identified as such on the Public Waters and Wetlands Maps.

The *Municipal Separate Storm Sewer System (MS4) Stormwater Permit* contains special requirements related to stormwater discharge to Outstanding Resource Value Waters. In Rochester, calcareous fens ("fens") fall into this protective category. The City is currently working with interested agencies, in particular the DNR, and local consultants to identify a method and obtain funding to develop a "fen probability map" for the City's urban growth areas. As fens are identified, the City must complete the following steps as part of its stormwater permit:

1. Identify the fens to which stormwater may discharge.
2. Map the watersheds in which the fens are located on topographic maps of 1:24,000 scale or better. With this, a narrative estimate must be provided of the percent impervious surface based on current land use and on development opportunities within the watersheds that may significantly affect runoff to the fens. A narrative assessment must then be developed that identifies of how the City's Stormwater Pollution Prevention Plan (SWPPP) can be reasonably altered to eliminate new or expanded discharges to the fens. This information must then be included in the SWPPP for public comment and a summary submitted with the City's first annual report.
3. Where there are no prudent and feasible alternatives to new or expanded discharges to the fens, the City must propose measures to restrict the discharge to the extent necessary to preserve the existing special characteristics that make the fens outstanding resource value waters. The selected best management practices (BMPs) must be included in the SWPPP for public comment and a summary submitted with the City's second annual report.
4. The City must submit a proposed plan that includes any prudent and feasible alternatives to new or expanded discharges to the fens. If the plan demonstrates that there are no prudent and feasible alternatives and as a result there are new or expanded discharges to the fens, the City must describe how discharges will be restricted to the extent necessary to preserve the existing special characteristics that make the fens outstanding resource value waters. The proposed plan must be submitted for MPCA review and approval with the City's third annual report. The plan will be reviewed by the MPCA Commissioner, who will provide opportunity for public input and hearing prior to denial or approval of the proposed plan.
5. The City must implement its approved plan during the 4th year of its permit. The plan must be included as part of the SWPPP; therefore, the 4th and 5th year annual reports must provide applicable implementation information for public comment and a summary with the annual reports.

13.0 WATER USE

Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)? ☒ Yes ☐ No

If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and DNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

13.a Introduction

The County Well Index (CWI) identifies approximately 270 water supply wells within the Project Area. A table containing CWI wells within the Project Area and their unique well numbers (where known) is included Appendix B. Project Area geologic features are shown in Figures 19-1 through 19-3. The majority of the wells are for private domestic use, however, municipal and industrial wells are included in this table. The wells range from 19 to 670 feet in depth.

To sustain its high quality drinking water supply, the City is currently working on the first phase of wellhead protection planning for its water supply wells (Joe Hensel, personal communication, December 12, 2003). The Wellhead Protection Plan is being developed according to Minn. R. Ch. 4720.5300 Wellhead Protection Plan Development procedures. These public water supply wells provide ground water to residents of Rochester from a variety of geologic bedrock units. At this time, RPU and the Minnesota Department of Health (MDH) are finalizing the computer modeling that is being used to identify and map areas (i.e., time of travel zones) that have potential to directly impact the groundwater used for domestic consumption (Figure 19-4). From these, Drinking Water Supply Management Areas (DWSMAs) will be developed. A DWSMA will encompass the surface watershed areas using political boundaries (e.g., parcels, roads, section boundaries, etc.) that surround the 1, 10 and 50-year time of travel zones that contribute recharge to each well. As new wells are drilled in the future, they will be added to the wellhead protection program. The wells in each sewershed that are associated with draft DWSMA are:

- Kings Run – Municipal water wells 28, 34, and 35 are located within this area. Municipal water well 38 has been installed and will be put into service in 2004.
- Northwest Territories – There are no existing municipal water wells in the wellhead protection plan in this area.
- Hadley Valley – Municipal water well 37, to be placed into service in 2004, is located within this area.

The final draft Phase I Report is nearing completion and it is anticipated that the final report will be brought before the RPU Board for adoption by the summer 2004. Phase 2 of the wellhead protection planning process will be a process of developing measures that help protect the quality of all recharge waters within the DWSMAs of the City's water supply wells and any other identified high priority areas.

As water lines are extended into the Project Area and individual connections to the public water supply are made, it is anticipated that the vast majority of the existing private residential wells will be abandoned. The City water quantities to be supplied to the Project Area will initially correlate directly with the current pumping capacities of existing water supply wells and ultimately grow to serve the anticipated development within the area. All wells that are abandoned when City water service is initiated are required to follow rules and regulations established by MDH, Minn. Stat. ch. 103I and Minn. R. ch. 4725.3850. Any wells retained for private non-domestic use will require a well maintenance permit from the ROPD, must meet water quality standards, and cannot be connected to the City water system. Interim development projects may install new private wells as long as an escrow account is established to fund future connection to municipal water systems, including water line construction and well abandonment.

Rochester Typical Water Consumption Information (Year-end, City-wide 2002 data):

Year-end Residential Customers:	28,681 homes
Population Served (Approximate):	93,000 persons
Average Persons Per Home (Approximate):	3.24 persons/home
Year 2002 Residential Water Sales:	2,829,000,000 gallons
Average Daily Customer Water Usage:	270 gallons/home/day = 83 gallons/person/day

Commercial and industrial water use varies by type of business and is not included above. RPU uses a 2.25:1 peak day/average day ratio for total water sales - not just residential sales.

Anticipated development of the area includes the installation of underground infrastructure such as sanitary sewer, water, and storm sewer lines or channels. Installation of this infrastructure and other excavation related to development in the area may require dewatering wherever the ground-water elevation is higher than the excavation. The DNR regulates water appropriation and permits for dewatering will be obtained by the appropriate party when required. The City will require contracts for public projects to investigate and evaluate potential dewatering impacts to nearby wells with a requirement to install temporary water service if warranted by impacts.

New wells, water towers, and water mains are planned to be installed in the future to serve the Kings Run, Northwest Territories, and Hadley Valley areas. The following provides a summary of the planned water distribution network in each area. As RPU conducts water supply planning and well siting, they evaluate water yields and aquifer impacts. As shown in Figure 19-4, an effort is made to site wells so that time of travel zones do not overlap. It has been RPUs customary practice to monitor the potentiometric surface of the St. Peter-Prairie du Chien-Jordan aquifer and changes to the area of ground-water contribution serving City. To date water quantity has not a significant issue, due to the aquifer capacity. RPU will continue monitoring and studying water supply issues in the Rochester area.

13.b Kings Run

Two new municipal water wells are planned for the Kings Run area. Well 38 has been installed and will be put into service in 2004. It is located in the NW ¼ of the NW1/4 of Section 7, T107N, R14W (Cascade Township). The other well will be installed in 2008 in the SE ¼ of the SE ¼ of Section 13, T107N, R15W (Kalmar Township) near the intersection of Highway 4 and 60th Avenue. Both of these wells will use the Jordan sandstone as their water source. There are no plans to use water from sources other than municipal water wells.

Two new municipal water towers are planned in the Kings Run area. One water tower will be constructed in 2005 and will have a capacity of 750,000 gallons. It will be constructed in the NE ¼ of the NE ¼ of Section 19, T107N, R14W (Cascade Township) near 50th Street north of Highway 4. The other water tower will have a capacity of 500,000 gallons and will be constructed in 2009. It will be located in the SE ¼ of the NE ¼ of Section 14, T107N, R15W (Kalmar Township) located just west of the intersection of Highway 4 and Highway 3. Similar to the Northwest Territories, water mains will be installed based on the needs of the area with major trunk mains spaced at approximately one-half-mile intervals. Individual developments will then tap into the mains as needed to service the developments as they are constructed.

13.c Northwest Territory

One new municipal water well is planned for this area in 2010. The well will be located in the NW ¼ of the SE ¼ of Section 33, T108N, R14W (Oronoco Township) southeast of the intersection of US 52 and 85th Street NW, and use the Jordan sandstone as its water source. There are no plans to use water from any source other than municipal water wells.

One new municipal water tower is planned for construction in 2010. The capacity will be 500,000 gallons and the tower will be located in the NW ¼ of the NW ¼ of Section 6, T107N, R14W (Cascade Township) about one-half mile east of Douglas.

Water mains will be installed based on the needs of the area as it is developed. Major trunk mains (12-inch diameter or larger) will be spaced at approximately one-half mile intervals. Individual developments will then tap into the mains as needed to service the developments as they are constructed.

13.d Hadley Valley

Once new municipal water well 37 is put into service in 2004, there are no plans for additional wells in this sewershed.. It is located in the NE ¼ of the NW ¼ of Section 19, T107N, R13W (Haverhill Township) about

one mile north of the intersection of Highway 2 and East Circle Drive, and use the Jordan sandstone as its water source. There are no plans to use water from sources other than municipal water wells.

One new municipal water tower is planned for construction in 2006. It will have a capacity of 1,500,000 gallons and will be constructed in the SW ¼ of the SE ¼ of Section 13, T107N, R14W (Cascade Township) east of Highway 63 about one-half mile south of 48th Street NE.

As with Northwest Territories and Kings Run, water mains will be installed as needed with major trunk mains spaced at approximately one-half-mile intervals and individual developments tapping into the mains as they are constructed.

14.0 WATER-RELATED LAND USE MANAGEMENT DISTRICTS

Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? ☒ Yes ☐ No

If yes, identify the district and discuss project compatibility with district land use restrictions.

Presently, specific development and infrastructure design plans are largely undefined for properties within the Project Area. Federal Emergency Management Agency floodplain mapping for the South Fork of the Zumbro River is shown is shown in Figures 10-4 through 10-6. Floodplain mapping is not available for many of the other streams in the Project Area. The determination of exact boundaries of floodplains, shorelands, and wetlands on properties within the area occurs when development projects are proposed or plans for roadway extensions or modifications or other infrastructure projects are submitted to the City as part of the GDP review process. Thus, specific physical impacts on water resources related to development are not known. Impacts to water resources identified as part of the GDP review process will be addressed on a case-by case basis. None of the waterways within the study areas, including the South Fork of the Zumbro River, are designated as Wild and Scenic rivers.

14.a Shoreland Zoning

DNR Shoreland Zoning, the *County Zoning Ordinance*, and the *City of Rochester Code of Ordinances* all restrict development within 1,000 feet of the ordinary high water mark of lakes and 300 feet of the ordinary high water mark of streams. As with most areas, the exact boundaries for shoreland zoning districts within the Project Area have not yet been determined. In general, land within 300 feet of the Public Water shown on Figures 10-4 through 10-6 that meet the required criteria would be classified and regulated as shoreland. Exceptions to this regulation would require obtaining a conditional use permit from the appropriate agency.

14.a.1 RWRP Expansion

The biosolid storage tanks may fall within the shoreland zoning district and may need a conditional use permit.

14.a.2 Trunk Sewer Extension

All trunk sewer extension work will be conducted in accordance with applicable City ordinances. The *City of Rochester Ordinance 62.1000* describes the specific requirements for construction/development of property within designated shoreland districts. In general, these requirements are focused on permanent above-ground structures; not underground utilities.

14.a.3 Secondary Development

The potential for future development in these areas may have an impact on the local drainage. Each of these developments must address drainage and surface water management issues, including the requirements of

City of Rochester Ordinance 62.1000, which describes the specific requirements for construction/development of property within designated shoreland districts.

14.b Floodplain

DNR Shoreland Zoning, the *County Zoning Ordinance*, and the *City of Rochester Code of Ordinances* regulate development within the floodway and 100-year floodplain.

14.b.1 RWRP Expansion

The RWRP proposed expansion area is outside of the floodway and 100-year floodplain. Portions of it fall within the 500-year floodplain.

14.b.2 Trunk Sewer Extension

In Kings Run and Hadley Valley, much of the conceptual trunk sewer alignment lies within areas that contain hydric and floodplain soils and floodprone soils. In the Northwest Territory limited portions of the proposed trunk sewer conceptual alignments fall within areas that have hydric and floodplain soils and floodprone soils (Figures 10-4 through 10-6).

Since the existing and proposed trunk sewers to serve the Project Area will be underground and existing surface elevations will be restored after construction, no permanent alterations of floodways or floodplains are anticipated. Erosion control methods will be necessary to prevent sediment transport during construction. Once construction is complete, vegetation will be reestablished in excavation areas. Loss of woodlands directly above trunk sewer extensions will be permanent.

14.b.3 Secondary Development

The potential for future development in these areas may have an impact on the local drainage. Each of these developments must address drainage and surface water management issues, including the requirements of *City of Rochester Ordinance 62.1000*. This ordinance prohibits development within the floodway and the requirement of a conditional use permit for development within the 100-year floodplain.

15.0 WATER SURFACE USE

Will the project change the number or type of watercraft on any water body?
☐ Yes ☒ No
If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

No changes or impacts are anticipated.

16.0 EROSION AND SEDIMENTATION

Give the acreage to be graded or excavated and the cubic yards of soil to be moved:
*acres; *cubic yards. Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.
*See text below.

16.a Introduction

Erosion is the loss of soil material as it is washed away by incident precipitation and overland flow. This can cause loss of fertile soil and washouts leading to formation of gullies. Sedimentation is the transport of eroded

soil material into stormwater conveyance and treatment facilities, lowlands, wetlands and surface waters. Erosion can result in the entry of sediment and other pollutants into the aquatic ecosystem. This, in turn, can cause water quality impacts, such as turbidity and eutrophication, and sedimentation in streams and lakes. The latter can adversely affect spawning activities for a variety of aquatic species.

The extent of impacts related to stormwater runoff and erosion during construction of the RWRP Expansion, the trunk sewer extensions, and secondary development depends on such factors as the incident rainfall or snowmelt quantity, the erodability of the local soil, and the degree of protection afforded by natural vegetation, or erosion and sediment control measures provided by the contractor. Impacts will also depend on how long it takes before vegetation is re-established. Several techniques for erosion and sediment control, called BMPs, are available. If these BMPs are implemented and maintained, there is no reason for significant erosion and sedimentation to occur. These techniques and other mitigation measures are provided for in the MPCA NPDES General Permit for Stormwater during Construction Activity, and the City's Grading and Drainage Plan and Grading Permit requirements.

The table in Appendix C identifies the United States Department of Agriculture (USDA) soil classifications for soils that are found within the Project Area and related slope, erodability, and permeability information. Steep slope soils (greater than 12 percent) and highly erodible soils may have a greater potential for sediment erosion and are shown on Figures 19-1 through 19-3. Special precautions will be taken in areas containing these types of soils to decrease the amount of erosion. Once construction is complete, these areas will be vegetated and permanent erosion control measures will be implemented to stabilize the soils.

In compliance with the amendments to the CWA, this project will require NPDES General Stormwater Permits for construction activity for each phase of construction. The objective of this permit is to implement temporary and permanent erosion and sediment control measures to reduce and eliminate erosion and keep sediments on-site during and after construction. These goals can be achieved by implementing BMPs on the project site as part of the temporary and permanent erosion control measures. These practices include removing accumulated sediment and repairing or replacing damaged and deteriorated erosion control devices. Temporary erosion control devices may include heavy-duty, high-flow silt fencing, rock check dams, and storm sewer inlet protection. Specific erosion controls are described in the MPCA publication "Protecting Water Quality in Urban Areas." These erosion control methods will be included in the City-required Grading and Drainage Plan for each project. Erosion control measures will be implemented prior to the start of any construction activities.

While constructing in floodprone areas associated with Kings Run and the South Fork of the Zumbro River, trench dewatering may be necessary. Dewatering discharges will be directed upgradient of the temporary erosion controls for settling and filtering. If dewatering discharges cannot be directed toward an existing silt fence or hay bale structure, filter bags or temporary sedimentation ponds will be used to contain and filter sediment from the dewatering discharge will not be an issue. Once construction is complete and the ground surface has been restored, ongoing impacts to surface-water runoff quantity or quality will be minor.

16.b RWRP Expansion and Trunk Sewer Extension

For Phases 1-3 of the RWRP Expansion, it is estimated that about 71,000 cubic yards (cy) of soil excavation and about 83,000 cy of rock excavation (for a total of about 154,000 cy) will occur. Grading will occur within the approximately 9.7-acre proposed RWRP Expansion area. In addition, some modification of the stormwater pond just west of the proposed RWRP Expansion area may be required to meet stormwater management requirements.

Based on an average depth of 15 feet and using traditional trench and fill construction methods, trunk sewer extensions may require the removal and replacement of approximately one million cy of soil and rock. Tunnel construction methods would result in less removal and no replacement. Based on a 100-foot construction corridor and trench and fill construction methods, grading could occur over an estimated 200 acres. Tunnel construction methods would result in less disturbance.

16.c Secondary Development

N development in the Project can result in increased erosion and sedimentation if proper erosion and sediment control is not provided. The City reviews grading and drainage plans for developments and provides on-site inspection and complaint response to help insure that proper erosion and sediment control measures are provided. The City has a Stormwater Management Plan (with addenda) that provide guidance on erosion and sediment control in new development and redevelopment areas. It further provides guidance on the development of the City's stormwater management system that will provide water quantity and quality protection for runoff from new developments, including sediment

Due to the large size of the Project Area and the relatively small scale of most soil unit mapping, a soil figure was not completed. However, steep slopes are shown in Figures 19-1 through 19-3. The table in Appendix C identifies the USDA soil classifications for soils that are found within the Project Area and related slope, erodability, and permeability information. Steep slope soils and highly erodable soils may have a greater potential for sediment erosion. Special precautions will be taken in areas containing these types of soils to decrease the amount of erosion. Once construction is complete, these areas will be vegetated and permanent erosion control measures will be implemented to stabilize the soils. The *City of Rochester Code of Ordinances* regulates development on bluffs and steep slopes. Bluffs are typically considered to consist of slopes greater than 18 percent and steep slopes are typically those with slopes greater than 12 percent and less than 18 percent. Development is not recommended or is described as poorly suited on steep slopes and not allowed within a specified distance from bluffs unless appropriate design or construction methods are approved. An evaluation of steep slopes and highly erodable soils is conducted as part of the City's GDP process.

The acreage of disturbed soil given on this worksheet represent an approximation of the amount of land disturbance potentially attributable to future secondary development following the installation of the sanitary trunk sewers. Preliminary planning estimates show the maximum amount of potential development that may occur in these areas is as follows:

- Kings Run – 5500 acres
- Northwest Territory – 6600 acres
- Hadley Valley – 4900 acres

These areas do not take into account any land to be reserved for public recreational use such as parks or other areas that will not create additional impervious area.

17.0 WATER QUALITY-SURFACE WATER RUNOFF

Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any stormwater pollution prevention plans.

17.a RWRP Expansion and Trunk Sewer Extension

The passage of the federal CWA Act resulted in USEPA's NPDES programs, which are intended to reduce pollutant loading and damage to waters of the United States. Three of these permit programs, administered in Minnesota by MPCA, are designed to specifically address impacts of stormwater runoff from construction sites, industrial facilities, and MS4s. Although, each permit has distinct requirements, all three permits require an evaluation of the quality and quantity of site runoff and the

environmental impacts of their associated discharges. Permittees are also required to prepare SWPPPs that outline temporary and permanent best management practices that reduce degradation of waters of the state. The City has an MS4 permit and a SWPPP that address the requirements of each of the six minimum control measures: public education, public participation, illicit discharge detection and elimination, construction site stormwater control, post-construction stormwater management, and pollution prevention techniques for municipal practices. The provisions of the MS4 permit apply to the entire City and complement the MPCA's construction site and industrial facility permit programs.

The RWRP Expansion and the trunk sewer extensions will require the management of surface-water runoff in accordance with the MPCA NPDES General Stormwater Permits and their associated SWPPPs. Additionally, these projects must comply with stormwater management standards set forth in the *Rochester Code of Ordinances* that require the preparation and approval of Grading and Drainage Plans. These Plans require an evaluation of stormwater management needs and identification of BMPs to manage water conveyance, water quantity to pre-development rates, and to provide for water quality protection. This evaluation will take place as part of the forthcoming final design process. The additional impervious surface created through the expansion of the RWRP will require the enlargement of an on-site stormwater treatment pond. Once construction is complete and the ground surface has been restored, ongoing impacts to surface water runoff quantity or quality will not be an issue, as long as the pond is appropriately maintained.

While constructing in floodprone areas associated with waterways within the study areas and the South Fork of the Zumbro River, trench dewatering may be necessary. Dewatering discharges will be directed upgradient of the temporary erosion controls for settling or filtering. If dewatering discharges cannot be directed toward an existing silt fence or hay bale structure, filter bags or temporary sedimentation ponds will be used to contain and filter sediment from the dewatering discharge. Following construction, vegetation will be restored to near-preexisting conditions, thus permanent mitigation measures should not be necessary.

During construction in waterways within the Project Area, silt control methods, such as placement of a sediment absorbing biodegradable mat in the stream bed at designated crossing locations or other effective sediment migration control methods, will be used to minimize the transport of sediment disturbed during excavation.

The installation of the trunk sanitary sewer extensions will not result in additional impervious surfaces, so no post-construction stormwater management will be required for the trunk sewers. The existing and proposed trunk sewer lines will not directly affect the drainage patterns in the study areas or change the volume or composition of runoff from the areas. During construction, stormwater runoff will be controlled as necessary with temporary erosion control measures that may include silt fences and rock check dams. Seeding and mulching will be completed to provide permanent vegetative drainage and erosion control.

17.b Secondary Development

Development enabled by the RWRP Expansion and trunk sewer extensions will result in additional stormwater runoff. When sewer service is provided to areas that are presently undeveloped, development will occur at a higher density than exists at present. One consequence of such development is a substantial increase in the area of impervious surfaces, in the form of rooftops, sidewalks, driveways, roadways and, to a certain extent, compacted lawns. If not properly managed, this impervious surface results in more runoff and poorer water quality. In addition, the amplitude of flow in receiving streams may increase, leading to increased erosion. The extent of such impacts will depend upon the density of development and upon mitigative measures implemented.

Rochester's growth has typically either been by orderly annexation or annexation requested by property owners through a formal petition to the City. Thus the developments of annexed areas will be under the zoning and land use control of the City. Land disturbances of an acre or more will require the management of surface-water runoff in accordance with the MPCA NPDES General Stormwater Permits and associated SWPPPs. Also, developments must comply with stormwater management standards set forth in the *Rochester Code of*

Ordinances (based on Stormwater Management Plan and addenda provisions) that require the preparation and approval of Grading and Drainage Plans. These Plans require an evaluation of stormwater management needs and identification of BMPs to manage water conveyance, water quantity to pre-development rates, and provide for water quality protection. This evaluation will occur during the preparation of each GDP. The additional impervious surface created through residential or commercial development will require the construction of regional stormwater ponds for water quantity and quality control in conjunction with conveyance facilities. Once construction is complete and the ground surface has been restored, ongoing impacts to surface-water runoff quantity or quality will not be an issue, as long as the facilities are appropriately maintained.

Developments within nearby townships that are not on land annexed to the City must follow stormwater management and erosion control regulations established by Olmsted County or the Township's zoning authority.

If stormwater runoff and erosion occur as a result of development enabled by the project, it will be reversible to the extent that construction of stormwater controls, conveyance, and treatment facilities can be performed retroactively. It is a far more acceptable strategy to provide such controls prior to or during the construction of the development. Permits requiring mitigation measures include: the NPDES General Permit for discharge of stormwater during construction activities, the *Rochester Code of Ordinances* and Stormwater Management Plan, and the Wetland Permits issued by the local WCA Local Governmental Unit representative. These permits will include specific mitigation measures related to water quantity and quality management.

17.c Stormwater Management Plans.

The City developed a comprehensive Stormwater Management Plan in 1997 and revised it in 1999 to serve as a guide for the expansion of the City's stormwater management system to serve new development and redevelopment areas. In addition to policies and recommendations, the Stormwater Management Plan includes:

- Locations and technical parameters for future regional ponds.
- Design standards for storm sewers and stormwater ponds.
- Guidelines for designing and maintaining the facilities necessary to collect and safely convey stormwater runoff through Rochester's drainage system.

The Stormwater Management Plan identifies water quality ponds that have been preliminarily sized and located throughout the City's future growth areas to provide treatment of runoff on a regional basis. The City requires developers to provide for construction and post-construction stormwater management attributable to their site, including the implementation of erosion control practices during development. The Stormwater Management Plan provides a list of recommended BMPs to be implemented to manage stormwater, which is the responsibility of the site owner and their contractor.

The cost of expanding the drainage system for new development is financed through a one-time Stormwater Management Plan Area Charge based on the proposed land use and size of the development, along with expenditures of Stormwater Utility Fees. Existing developed property is not assessed the Stormwater Management Plan Area Charge, but is charged a monthly Stormwater Utility Fee based on the size of each property and the amount of impervious surface on it.

Since the completion of the City-wide Plan in 1997, rapid City growth has resulted in the need for additional special reports and Stormwater Management Plan addenda to address additional watershed impacts and areas located in the growth areas surrounding the City, including:

- Cascade Township Section 7 Stormwater Report
- Northwest Territory Addendum
- Hadley Valley Addendum
- Bear Creek Addendum

18.0 WATER QUALITY – WASTEWATER

18.a Sources, Composition, and Quantities

Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

Homes and businesses within the western portion of the Kings Run sewershed and the Northwest Territory sewershed are currently served by individual septic systems. However, the homes and businesses in the eastern portion of Kings Run are served by the City's sanitary sewer system that conveys the wastewater generated in this portion of Kings Run to the RWRP. The homes and businesses in the western portion of the Hadley Valley area are served by the City's sanitary sewer system that conveys wastewater to the RWRP. The eastern portion of the Hadley Valley area, however, is currently unsewered and the homes and businesses in that portion of Hadley Valley are served by individual septic systems.

Wastewater generated from future development in the Kings Run, Northwest Territory, and Hadley Valley areas is expected to be primarily domestic (i.e., residential and commercial). Table 18-1 provides the anticipated average concentrations of various wastewater influent constituents to characterize wastewater quality, based on current RWRP daily monitoring reports from 1998 through 2002 (January 2003 Amendment to the Rochester Wastewater Master Plan).

TABLE 18-1

MAJOR INFLUENT WASTEWATER CHARACTERISTICS FOR THE RWRP

Average Annual Concentration of Influent Constituents	
$CBOD_5$	300 mg/L
TSS	200 mg/L
NH_3-N	18.0 mg/L
Total Phosphorous	8.0 mg/L
Per Capita Flow Annual Average	160 gpcd
Per Capita Flow Maximum Month	200 gpcd
Per Capital Flow Average Dry Weather	133 gpcd

Notes:

$CBOD_5$ = 5-day Carbonaceous biochemical oxygen demand
TSS = total suspended solids
NH_3-N = ammonia nitrogen
mg/L = milligrams per liter
gpcd = gallons per capita per day

Future wastewater production rates for planned development within the Project Area were estimated using the following criteria:

Average dry weather flow	700 gallons per acre per day (gpad)
Peak day flow	1,400 gpad
Peak wet weather flow	3,500 gpad

Using the above wastewater production rates, the projected flows for sizing the trunk sewer extensions for Kings Run, Northwest Territory, and Hadley Valley were calculated using the data shown in Table 18-2: These flow calculations were used for designing the trunks sewer extensions only. Wastewater characteristics and flows used in the design of the RWRP Expansion are discussed in the response to Question 18b.

TABLE 18-2
PROJECTED AVERAGE AND PEAK WASTEWATER FLOWS

Service Area	Total Area (Acres)[1]	Developable Area (Acres)[2]	Average Day Dry Weather Flow (mgd)	Peak Day Dry Weather Flow (mgd)	Peak Wet Weather Flow (mgd)
Kings Run	8,405	7,128	5.0	10.0	24.9
Northwest Territory	7,983	6,658	4.7	9.3	23.3
Hadley Valley	6,952	4,896	3.4	6.9	17.1
Total	**23,340[1]**	**18,682**			

Notes:
1 The Project Area boundary was slightly modified since this acreage was calculated and now actually covers 21,914 acres. The total acreage shown in this table was used for sizing the trunk sewers, and the difference will not result in any changes in sewer sizes.
2 The number of developable acres also changed slightly due to the minor changes in the Project Area. In addition, the 7,128 acres of developable area shown on this table includes approximately 4,889 acres within Kings Run that were already developed (as shown in Table 9-1) to establish a "worst case" maximum flow.

As indicated previously, the eastern portion of Kings Run and the western portion of Hadley Valley are currently served by sewers that convey wastewater to the RWRP. Table 18-3 is a summary of the current flows generated by the portions of the Project Area that are currently served by sewers and the estimated future average day flow for the areas when they are fully developed with sewer service provided. The trunk sewer lines to serve these areas will have design capacities in excess of one million gpd.

TABLE 18-3
SUMMARY OF CURRENT WASTEWATER FLOWS

Area	Current Average Day Flow (mgd)	Projected Future Average Day Flow (mgd)
Kings Run (Served)	1.16	3.52
Western Kings Run	0.00	1.47
Northwest Territory	0.00	4.70
Western Hadley Valley (Served)	0.61	0.68
Eastern Hadley Valley	0.00	3.40
Total		13.77

18.b Wastewater Treatment Methods

Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

18.b.1 Downstream Receiving Waters

As noted previously, wastewater will be conveyed by existing and new trunk sewers to the RWRP. Wastewater is treated at the RWRP to meet the current NPDES/State Disposal System (SDS) Permit limits presented in Table 18-4. Treated wastewater from the RWRP is discharged to the South Fork of the Zumbro River.

Impaired waters are listed and reported by the MPCA in the 305(b) report and 303(d) list; the 305 and 303 nomenclature refers to the applicable sections of the CWA. The South Fork of the Zumbro River ultimately flows into Lake Zumbro that is listed as an impaired water due to excess nutrients (affected use-aquatic recreation) and mercury (affected use-aquatic consumption) (2004 MPCA draft 303(d) List). The *Guidance Manual for Assessing the Quality of Minnesota Surface Waters* (MPCA Jan. 2003) defines impaired waters as those not meeting water quality standards and not supporting assigned beneficial uses.

The South Fork of the Zumbro River drains 363 square miles to Lake Zumbro, while the Middle Fork of the Zumbro River drains 434 square miles to Lake Zumbro. The Lake Zumbro valley adds drainage from two other minor watersheds totaling 24 square miles. Therefore, drainage from the South Fork of the Zumbro River contributes approximately 45 percent of the total drainage to Lake Zumbro (Interactive Watershed Web page, United States Geological Survey [USGS] Oct. 2000).

18.b.2 Wastewater Characteristics

The effluent limits presented in Table 18-4 were established by the MPCA through the previous NPDES/SDS permitting process. Proposed new effluent limits have been established by the MPCA as shown in Table 18-5 and related correspondence is included in Appendix D. These proposed future limits will be incorporated in a draft NPDES/SDS Permit that will undergo a 30-day public comment period before the permit and related limits are finalized. Since the new NPDES/SDS Permit and associated effluent limits are for a five-year period, they will pertain to Phase 1 of the RWRP Expansion. Future regulations, including potential Total Maximum Daily Load (TMDL) criteria for the waters downstream of the RWRP, will be considered in association with future RWRP NPDES/SDS Permit limits. The MPCA has estimated that it will likely be five to eleven years before TMDLs for downstream waters are established. The purpose of the TMDL is to focus attention and resources on impaired waters to ultimately bring them back into compliance with water quality standards (MPCA January 2003).

TABLE 18-4

EXISTING PLANT EFFLUENT LIMITS TO ZUMBRO RIVER (Based on 19.1 mgd Average Wet Weather Flow)

Plant Effluent Characteristics	Current NPDES/SDS Permit Limits	Current NPDES/SDS Permit Mass Limits
$CBOD_5$	14 mg/L	1,011 kg/day
TSS	20 mg/L	1,444 kg/day
NH_3-N	1.6 mg/L	116 kg/day
DO	5.0 mg/L	None
Phosphorous	1.0 mg/L	72.2 kg/day
Fecal Coliform, April – October	200 organisms/100 mL	None
pH	6.0 Min to 9.0 Max	None
Chlorine Residual	0.1 mg/L daily; maximum value	None

Notes: mgd = million gallons per day
mg/L = milligrams per liter
mL = milliliter
kg/day = kilograms per day
Min = minimum
Max = maximum
DO = Dissolved Oxygen

TABLE 18-5

PROPOSED FUTURE RWRP EFFLUENT LIMITS
ANNUAL FLOW TO THE SOUTH FORK OF THE ZUMBRO RIVER
(Based on 23.85 mgd average maximum month flow, current capacity plus Phase 1 RWRP Expansion)

Plant Effluent Characteristics	Proposed NPDES/SDS Permit Limits	
	Limits	Mass Limits
$CBOD_5$	15 mg/L calendar month average	TBD**
TSS	30 mg/L calendar month average	TBD
NH_3-N	calendar month average	--
Summer	3 mg/L	TBD**
Fall	13 mg/L	TBD**
Winter	5 mg/L	TBD**
Spring	10 mg/L	TBD**
DO	5.0 mg/L daily minimum	NA
Phosphorus	1.0 mg/L calendar month average	72.2 kg/day*
Mercury	10.0 ng/L calendar month average 17 ng/L daily maximum	NA
Fecal Coliform, April-October	200 organisms/100 mL	NA
pH	6.0 Min to 9.0 Max	NA
Chlorine Residual	0.038 mg/L daily maximum value	NA

Notes:
ng/L =nanograms per liter
kg/day =kilograms per day
DO =dissolved oxygen
NA = not applicable
TBD = to be determined
*Fixed mass limit.
**To be determined once final flows are approved by MPCA, see Section 18.b.3

A discussion of effluent parameters is presented below:

18.b.2.1 Carbonaceous Biochemical Oxygen Demand, Ammonia-Nitrogen , and Dissolved Oxygen

Carbonaceous Biochemical Oxygen Demand ($CBOD_5$) is the amount of oxygen required by aerobic microorganisms to decompose organic matter in a water sample, based on the maximum rate of oxygen consumption in a water sample over a five-day period in the dark at 20 degrees Celsius. This method uses a chemical inhibitor to block nitrification, thus preventing the nitrogenous, or second stage BOD from being consumed (MPCA Environmental Data Access Web page 2004). $CBOD_5$ is used to estimate the total amount of "biodegradable" organic matter in the system and therefore serves as a measure of the degree of water pollution.

Ammonia-nitrogen (NH_3-N) is an inorganic form of nitrogen contained in fertilizers, septic system effluent, and animal wastes. It is also a product of bacterial decomposition of organic matter. NH_3-N becomes a concern if high levels of the un-ionized (dissolved gas) form are present. In this form, NH_3-N can be toxic to aquatic organisms. The presence of un-ionized ammonia is a function of the NH_3-N concentration, pH, and temperature. Conversion of NH_3-N to nitrate-nitrogen (NO_3-N) by nitrification requires large quantities of oxygen, which can kill aquatic organisms due to the resultant lowered DO concentrations in water (MPCA Web page 2004).

18.b.2.2 Total Suspended Solids

Total suspended solids (TSS) are very small particles remaining dispersed in a liquid due to turbulent mixing that can create turbid or cloudy conditions (MPCA Environmental Data Access Web page 2004).

18.b.2.3 Phosphorus

Phosphorus is a nutrient essential to the growth of organisms, and is commonly the limiting factor in the primary productivity of surface water bodies. Total phosphorus includes the amount of phosphorus in solution (reactive) and in particle form. Agricultural drainage, wastewater, and certain industrial discharges are typical sources of phosphorus, and can contribute to the eutrophication of surface water bodies (MPCA Environmental Data Access web page 2004).

Controlling phosphorus is an important part of protecting Minnesota's water resources. Excess phosphorus causes nuisance algae blooms and reduced water transparency, making waters unsuitable for swimming or other activities. Phosphorus comes from both point and nonpoint sources. Point sources consist mainly of municipal and industrial wastewater discharges. Nonpoint sources include runoff from agricultural fields, feedlots, urban areas, and on-site sewage treatment systems (MPCA Phosphorus Strategy web page 2004).

18.b.2.4 Mercury

Wastewater treatment plants are typically very minor dischargers of mercury. Mercury is a naturally occurring element (About Mercury web page, MPCA 2004). Mercury is widespread in the environment and comes from numerous sources, both natural and human. Nearly all the mercury in lakes results from air emissions, such as emissions from coal-fired power plants, waste incinerators (including sewage sludge incinerators), the smelting of metals, and natural sources such as volcanoes and the weathering of rocks. The mercury present in northeastern Minnesota lakes comes from the following sources:

- Regional pollution 40%
- Global pollution 30%
- Natural global mercury 30%

Airborne mercury is eventually deposited in water or on the ground where surface runoff carries it into water. Wastewater treatment plants receive mercury in wastewater from residential, commercial, and industrial sources, including dental clinics and medical facilities (Metropolitan Council Environmental Services Mercury Reduction Strategy Web page, Metropolitan Council 1999).

18.b.2.5 Fecal Coliform, pH, and Chlorine Residual

Fecal coliform bacteria are found in the intestinal tract of humans and animals. The presence of fecal coliform bacteria in aquatic environments indicates that the water has been contaminated with the fecal material of man or other animals. Fecal coliform bacteria are commonly used as indicators of the presence of pathogenic organisms and other disease-causing bacteria, such as those that cause typhoid, dysentery, hepatitis A and cholera. Fecal coliform is measured in the number of bacteria per 100 milliliters of water (MPCA Environmental Data Access Web page 2004). Failing septic systems and runoff from feedlots are common sources of fecal coliform in water samples. Fecal coliform bacteria can enter rivers through direct discharge of

waste from mammals and birds, from agricultural and storm runoff, and from untreated human sewage. Individual home septic tanks can become overloaded during the rainy season and allow untreated human wastes to flow into drainage ditches and nearby waters. Agricultural practices such as allowing animal wastes to wash into nearby streams during the rainy season, spreading manure and fertilizer on fields during rainy periods, and allowing livestock watering in streams can all contribute fecal coliform contamination (USEPA Fecal Coliform web page). Due to the fact the public wastewater treatment plants treat human waste, they can also be a source of fecal coliform. The RWRP disinfects for pathogens using chlorine. The pH (Potential of Hydrogen) is a measure of the relative acidity or alkalinity of water. The pH scale ranges from 1 to 14, with 1 being the most acidic and 14 the most alkaline. Pure water is neutral with a pH of 7 (MPCA Environmental Data Access Web page 2004).

Chlorine is used to continuously disinfect RWRP discharge in order to destroy three categories of human enteric pathogens: bacteria, viruses, and amebic cysts (Water Pollution and Control Web page, Ames, IA 2002). The RWRP neutralizes (through dechlorination) the chlorine in its effluent prior to discharging to the South Fork of the Zumbro River. Chlorine residual refers to the amount of chlorine left in the effluent after dechlorination takes place prior to discharge.

18.b.3 Impacts of Discharge on Downstream Receiving Waters

As described, wastewater effluent from the RWRP is discharged to the South Fork of the Zumbro River, which ultimately flows to Lake Zumbro. Minn. R. 7050.0180 and 7050.0185 address the non-degradation of Outstanding Resource Value Waters and all waters of the state, respectively. It is Minnesota's policy to protect all waters from significant degradation from new or expanded point and non-point sources and wetland alterations, and to maintain existing water uses, aquatic and wetland habitats, and the level of water quality necessary to protect these uses.

The RWRP Expansion will not impact any Outstanding Resource Value Waters. However, the RWRP Expansion will result in the expanded, point-source discharge of treated wastewater to waters of the state. As required by rule, the RWRP has submitted the necessary information for the MPCA to determine if the expanded discharge is significant. The MPCA has reviewed the draft RWRP non-degradation report and developed the resultant proposed permit limits identified in Table 18-5.

In addition to setting the RWRP permit limits, the MPCA also uses the submitted information to determine whether additional control measures can reasonably be taken to minimize the impact of the discharge on the receiving water. In making its decision, the MPCA must consider the importance of the economic and social development impacts of the project, the impact of the discharge on the quality of the receiving water, the characteristics of the receiving water, the cumulative impacts of all new or expanded discharges on the receiving water, and the costs of additional treatment. RWRP will be responsible for implementing the control measures through modified design and operational processes to meet the proposed effluent limits as identified in Table 18-5.

For purposes of this EAW, the future discharge limits proposed by MPCA will be considered the 'worst case' future discharge. A detailed discussion of impacts from each permit parameter is provided below.

In order to evaluate of the impact of RWRP discharge on downstream waters, mass loadings were calculated based on the current NPDES/SDS Permit average concentration limits. Mass loading is defined as the mass of a material entering an area per unit time. In this case, the mass (in kilograms) of an effluent parameter entering the South Fork of the Zumbro River in a day is based on the permitted average concentration limit. At the 19.1 mgd average wet weather design flow, the calculated mass loadings are:

- $CBOD_5$ 1,011 kilograms (kg)/day (calculated)
- TSS 1,444 kg/day (calculated)
- NH_3-N 116 kg/day (calculated)
- Phosphorus 72.2 kg/day (calculated)

Mass loadings were then calculated for the proposed future discharge limits, with the exception of phosphorus, which has a proposed fixed mass limit as described in section 18.b.1.2 below.

- $CBOD_5$ 1,352 kg/day (calculated)
- TSS 2,704 kg/day (calculated)
- NH_3-N
  - o *Summer* 270 kg/day (calculated)
  - o *Fall* 1,172 kg/day (calculated)
  - o *Winter* 450 kg/day (calculated)
  - o *Spring* 901 kg/day (calculated)
- Phosphorus 72.2 kg/day (fixed mass limit in proposed future permit)

In order to evaluate the impacts of the discharge on downstream receiving waters, the MPCA requires the use of average seasonal flows and the seven consecutive-day, ten-year low flow (known as the $7Q_{10}$) for the receiving water. Increases in pollution loading were assessed by comparing the monthly discharge concentrations (Table 18-4) with the future discharge limits (Table 18-5), and the respective mass loadings as shown above.

In addition, other pollutants for which there is either no change in permitted discharge limit or there is no existing discharge limit, include:

- Dissolved oxygen. The proposed future discharge limit is the same as the current limit, a daily minimum of 5.0 mg/L. There is no applicable mass limit.
- Mercury. There is no current limit. The proposed future discharge limit is 10.0 ng/L. There is no applicable mass limit.
- pH. The proposed future discharge limit is the same as the current limit: minimum 6.0 and maximum 9.0. There is no applicable mass limit.
- Total Chlorine residual. The proposed future discharge limit is 0.038 mg/L is for practical purposed same as the current limit, due to the detection level of the analytical test used. There is no applicable mass limit.
- Fecal coliform bacteria. The proposed future discharge limit is the same as the current limit: 200 organisms/100 mL. There is no applicable mass limit.

MPCA's proposed permit limits were developed to protect the receiving waters into which the RWRP discharge occurs; therefore impacts to water quality and aquatic life are expected to occur within acceptable limits. The reasoning behind the proposed future limits is presented below.

18.b.3.1 Carbonaceous Biochemical Oxygen Demand, Ammonia-Nitrogen, and Dissolved Oxygen

The RWRP's current NH_3-N limit comes from the 1970's water quality standard that was based on total NH_3-N. A 1980 revision to the rules introduced the un-ionized NH_3-N water quality standard. Non-ionized ammonia (NH_3) is the principal form of toxic ammonia. It has been determined to be toxic to freshwater organisms in concentrations in the threshold range of 0.53 to 22.8 mg/L. This references the concentration in receiving waters after dilution, not the effluent level. Toxic levels are both pH and temperature dependent. Toxicity increases with decreasing pH (as the water becomes more acidic and less basic) and as the water temperature decreases. In 1999, the USEPA issued new guidance to states on NH_3-N, which reflects the latest information on the toxicity of ammonia to aquatic life. About 80 cities and industries in Minnesota have effluent limits for

NH_3-N based on meeting the current standard in the receiving stream. The proposed new standard will affect the effluent limits for some of these dischargers, particularly if they expand and new limits are needed. Some limits based on the proposed standard may be relaxed and some may become more stringent, depending on the season and seasonal pH and temperatures in the receiving stream.

The MPCA has applied a $CBOD_5$ and ammonia linkage option over the last ten years. This allows the MPCA to offer a $CBOD_5$ limit that is higher than identified in Minn. R. 7050.0213 for Class 2B waters if the discharger offers to meet an ammonia limit that is lower than required in Minn. R. 7050.0210 and .0222 for Class 2B waters. The variable ammonia limit is based on variations of in stream nitrification levels and related changes in oxygen demand as it impacts oxygen levels available to aquatic species.

Many NPDES Permits are presently written with seasonal limits for NH_3-N, that are equally or more protective than the straight limit since there will be little, if any, in-stream nitrification in the winter, consequently there would not be an oxygen demand exerted by the NH_3-N. This allows more cost effective design of treatment facilities by allowing single stage nitrification processes, which have adequate effectiveness during warm weather. The variable NH_3-N limit is based on variations of in stream nitrification levels and related changes in oxygen demand as it impacts oxygen levels available to aquatic species.

A DO daily minimum limit of 5.0 mg/L was incorporated in the future permit due to the low dilution ratio of river water to wastewater at the $7Q_{10}$.

18.b.3.2 Total Suspended Solids

The proposed future TSS permit limit of 30 mg/L is a relaxation of the 20 mg/L limit in the current permit. In the current permit, TSS was used as an indicator of polychlorinated biphenyl (PCB) concentrations due to inferred and commonly accepted linkages. At that time, MPCA selected a lower than allowable TSS limit to conservatively control PCB levels, given the absence of regulatory limits for them. The TSS level in the current permit was established based on PCB's found in fish tissue data obtained by the MDH and DNR in the 1970s. PCB usage and release to the environment has been greatly reduced over the last two decades and more recent fish tissue sampling has not been conducted. The RWRP has water quality data showing that PCBs are at the "no detect" level in RWRP effluent samples. The "no detect" level of PCBs in RWRP effluent, the institution of the proposed new mercury standard, and the classification of the South Fork of the Zumbro River now justifies the proposed TSS 30 mg/L limit.

18.b.3.3 Phosphorus

The MPCA proposed future mass loading phosphorus limit of 72.2 kg/day remains the same as the current permit to satisfy federal regulations concerning expanded discharges (of parameters for which a water is considered impaired) upstream of impaired waters (Lake Zumbro). The future mass loading phosphorus limit of 72.2 kg/day is based on the current limit of 1 mg/L and the 19.1 mgd average wet weather design flow. By setting the calendar month average limit at 1.0 mg/L and freezing the mass limit, Rochester's phosphorous limit will be effectively lowered to approximately 0.80 mg/L.

18.b.3.4 Mercury

The water quality standard is 6.9 ng/L. The monthly average permit limit is 10 ng/L, and the daily maximum is 17 ng/L. The derivation of the permit limits is statistically based and related to the number of samples used to determine the monthly average limit. The permit will require twice/month sampling which equates to a 10 ng/L monthly average based on meeting the water quality standard at the end-of-pipe.

18.b.3.5 Fecal Coliform, pH, and Chlorine Residual

The discharge limits for fecal coliform (200 organisms/100 mL) and pH (6.0 Min. to 9.0 Max.) remain the same in the current and MPCA proposed future permits.

18.b.3.6 Lake Zumbro Impacts

The MPCA conducted a detailed evaluation of Lake Zumbro in 1988, with specific reference to RWRP discharges (MPCA 1988, 1989 update). Lake Zumbro has been listed by the MPCA as an impaired water due to excess nutrients (affected use, aquatic recreation) and mercury (affected use, aquatic consumption) (2004 MPCA draft 303(d) List). The impacts of the RWRP discharge for nutrients and mercury are assessed here.

Nutrients

The mass loading for phosphorus will be maintained in the proposed future discharge limits, because federal regulations do not allow increased pollutant loadings of the parameters for which a water is impaired in cases where expanded discharges occur upstream of impaired waters (Tables 18-4 and 18-5).

The MPCA study (MPCA 1988, 1989 update) estimated annual phosphorus budgets to Lake Zumbro based on 1988 conditions. They reported annual total phosphorus loads to Lake Zumbro as:

Source	**Annual Total Phosphorus Load (kg)**
RWRP Discharge	11,553 (56%)
Other Sources	9,036 (44%)

These estimates assumed there was no attenuation of phosphorus between the RWRP discharge and Lake Zumbro. The MPCA report evaluated the impacts of phosphorus inputs to Lake Zumbro using the BATHTUB model. The modeled lake phosphorus concentrations at low, median and high river flows, with the RWRP total phosphorus discharge at 1 mg/L were: 111, 121, and 135 parts per billion, respectively. The report found that Lake Zumbro phosphorus concentrations were sensitive to mass loadings more than hydraulic loadings. This means lake phosphorus responds to changes in phosphorus mass inputs without consideration of a range of water flows from the RWRP or other sources. Because we are evaluating changes in phosphorous mass loading from the RWRP, this model can be used to evaluate the impacts of increased phosphorous mass loading from RWRP without considering increases in discharge volumes. However, the proposed future mass loading limit puts an upper threshold on the total, cumulative amount of phosphorus that can be discharged, therefore no increases in lake phosphorus loading would occur as a result of the RWRP Expansion or the trunk sewer extension.

The modeling analysis in the MPCA study (1988, 1989 update) did not explicitly include phosphorus recycling from sediments already within the lake, which likely represents a significant impact. Phosphorus from sediments within the lake originates from agricultural and residential runoff, RWRP discharge, and other miscellaneous sources. That study also recommended future monitoring to account for this phosphorus source. Furthermore, the background phosphorus loads likely have changed since 1988. *The Effects of Phosphorus Removal at the Rochester Water Reclamation Plant for the Summer of 1990* (Shapiro 1991) found a correlation between the phosphorus in the RWRP discharge, normalized to pounds/cfs, and total phosphorus concentration in Lake Zumbro. Therefore, since the RWRP effluent concentration limit in mg/L will not increase, based on this correlation, there will not be an additional impact to Lake Zumbro. In fact, based on this correlation and the fact that the mass loading limit effectively lowers the average concentration to 0.8 mg/L (due to the increase in flow from 19.1 to 23.85 mgd), the potential for negative impacts to Lake Zumbro may be less likely.

Much change has occurred or will occur in the watershed of Lake Zumbro. The previous study (MPCA 1988, 1989 update) should be updated using contemporary information and methods in order to make a more accurate

and current assessment of nutrient impacts on Lake Zumbro. TMDL studies for Lake Zumbro and the South Fork of the Zumbro River are pending. As part of this lengthy and intensive process, future RWRP discharge limits will be revisited. In the meantime, since the total phosphorus load from the RWRP is not to be increased, it is reasonable to conclude there will not be increased impacts to Lake Zumbro as a result of the RWRP Expansion.

Mercury

There have been fisheries consumption advisories for fish from Lake Zumbro since the late-1970s. According to the MPCA study, the mercury contamination in Lake Zumbro appears to originate in Rochester at Silver Lake upstream of the RWRP and continues downstream into Lake Zumbro. While mercury is a widespread environmental contaminant and all sources should be reduced where possible, the RWRP contribution will be limited and would not appear to represent a significant contribution to fish contamination in Lake Zumbro. Mercury limits are new to the RWRP, but it is expected that discharges will be within state and federal water quality standards for mercury.

Trigger for Mercury Nondegradation

Mercury is known to be in municipal effluents and is primarily associated with total suspended solids in the effluent. A mass loading increase of TSS, and therefore a mercury load increase would meet the requirements of a new discharge in Minn. R. 7050.0180, requiring a nondegradation review, and subsequent permit limits for mercury. The City has provided a review.

Mercury Nondegradation Review

The previous facility permit contained limitations for ammonia and phosphorous. The proposed facility permit also contains ammonia and phosphorous (bio-P) limits, which will achieve low TSS concentrations. The addition of effluent multi-media filters to this proposal would raise the cost of the project 35 percent (an estimated $17,750,000 above the proposed project cost of $50,000,000) with no guarantee of concurrent mercury removal. Data on the removal of mercury when stepping up treatment from the proposed facility design to effluent filtration does not exist at this time. Further, the use of micro filtration (double the cost of multimedia filters or $34 million dollars capital construction costs; $480,000/year operational costs) is cost prohibitive and no guarantee exists that further removal would occur.

The City has indicated that it would be more effective to employ a public education strategy, and institute controls through employment of mercury reduction plans for internal users such medical-dental facilities in the community. This position coincides with MPCA policy preferences for municipal facilities. Pollution reduction processes will be the subject of a Mercury Pollutant Minimization Program as a permit requirement.

18.c Public Treatment Facility Capacity

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

As noted previously, wastewater will be conveyed to the RWRP, which is being expanded to meet future growth needs. No pretreatment systems are required at the RWRP; although several industrial facilities within the City have individual pretreatment permit requirements which require them to operate their own pretreatment systems. Upon expansion, the RWRP will be fully capable of handling the wastewater flow volume and composition conveyed by the trunk sewers carrying wastewater generated in the City's sewer service areas.

18.d Liquid Animal Manure

If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.

No animal manure is involved in the project.

19.0 GEOLOGIC SOIL CONDITIONS

19.a Geologic Site Hazards

Approximate depth (in feet) to Ground water: **0 feet** minimum; **15 feet** average.
Bedrock: **10 feet** minimum; **50 feet** average.

Describe any of the following geologic site hazards to ground water and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

19.a.1 Depth to Ground Water and Bedrock

Ground water in the Project Area is typically shallow with depths of 10 to 40 feet common. The regional water table level appears to range from approximately 0 to 300 feet below grade (*Minnesota Geological Survey [MGS] Olmsted County Geologic Atlas*, *University of Minnesota 1988*). Areas near surface ground water, Decorah shale, or significant clay till deposits can present a geologic hazard as it relates to construction of infrastructure or building foundations if poor engineering practices are not selected or implemented.

According to the *Geologic Atlas*, depth to bedrock in the Project Area ranges from approximately 0 to as much as 250 feet. Actual depth to bedrock is highly dependant on local topography and the presence of a buried bedrock valley in the western portion of the Project Area. Bedrock types in this area are primarily Ordovician age limestone, sandstone, and shale. The word "karst" refers to a type of terrain, usually formed on carbonate rock (limestone and dolomite) where ground water has solutionally-enlarged openings to form a subsurface drainage system. In Olmsted County, karst conditions exist where the depth to limestone bedrock is shallow. Geologic information for the Project Area is presented on Figures 19-1 through 19-3.

19.a.1.1 Kings Run

In the Kings Run area, the depth to ground water ranges from 0 to 80 feet. According to the *Geologic Atlas*, the bedrock in the Kings Run area ranges in depth from less than 50 feet to as much as 250 feet. The depth to bedrock is less than 50 feet over most of the east side of the area. There are narrow zones along the South Fork Zumbro River that have bedrock at a depth of between 51 and 100 feet. On the west side of the area there is a buried bedrock valley where the depth to bedrock is as much as 250 feet in the bottom of the valley. There are buried side valleys that enter the main valley where the depth to bedrock ranges from 51 to 200 feet.

19.a.1.2 Northwest Territory

In the Northwest Territory area, the depth to ground water ranges from 0 to 80 feet. According to the *Geologic Atlas*, the depth to bedrock in this area varies from less than 50 feet up to 250 feet. Over most of the eastern half of the area, the depth to bedrock is less than 50 feet. However, in the west side of the area there is a buried bedrock valley where the depth to bedrock increases significantly. The center of the buried bedrock valley is mapped as having a depth to bedrock of between 201 and 250 feet in places. There are side valleys that enter the main valley that have depth to bedrock of 51 to 200 feet.

19.a.1.3 Hadley Valley

In the Hadley Valley area, the depth to ground-water ranges from 0 to 30 feet. In the Hadley Valley area, the *Geologic Atlas* indicates that the depth to bedrock is between 0 to 50 feet over nearly the entire area. There are narrow zones along the South Fork Zumbro River where the depth to bedrock is between 51 to 100 feet.

19.a.2 Sinkhole Probability

The *Geologic Atlas* was used to evaluate the probability of sinkholes to be present within the Project Area. The plate indicating sinkhole probability in Olmsted County is based primarily on information provided by local residents and landowners. Other sources regarding sinkhole locations included USGS topographic maps, NRCS information, and aerial photos. Sinkholes and springs identified in the ROPD GIS database are shown in Figures 19-1 through 19-3. A geologic column for Olmsted County from the *Geologic Atlas* is shown in Appendix B.

According to the *Geologic Atlas*, most of the Project Area falls within either the low probability or low to moderate probability categories with only relatively small areas falling into the moderate to high probability or the high probability categories. The categories are defined as follows:

- Low probability areas are underlain by carbonate bedrock, where essentially no sinkholes were observed. In Olmsted County, very few sinkholes were observed where there is more than 50 feet of cover over bedrock.
- Low to moderate probability areas are underlain with carbonate rock covered with only a thin layer of surficial material, and contains only widely scattered individual sinkholes or isolated clusters of two or three sinkholes.
- Moderate to high probability areas have a sinkhole density of one to five sinkholes per square mile and occur as diffuse clusters of three or more sinkholes.
- High probability areas have sinkholes as a common aspect of the landscape with densities of 5 to 20 sinkholes per square mile. The high probability areas are sometimes found on highlands adjacent to river valleys where the steeper hydrologic gradients near the valley may be contributing to karst erosion.

19.b.2.1 Kings Run

In the Kings Run area, the approximate percentages of the various sinkhole probabilities are:

- Low probability – 60 percent
- Low to moderate probability – 40 percent

There are no sinkholes mapped by the MGS on the Geologic Atlas for the Kings Run Area.

19.b.2.2 Northwest Territory

In the Northwest Territory area, the approximate percentages of the various sinkhole probabilities are:

- Low probability – 45 percent
- Low to moderate probability – 40 percent
- Moderate to high probability – 5 percent
- High probability – 10 percent.

Most of the sinkholes mapped by the MGS are located north of 85th Street NW and east of Highway 52 in the area designated high probability. Two sinkholes are also found north of 75th Street NW and east of 50th Avenue NW in an area designated low to moderate probability. These sinkholes area all developed in the Prairie du Chien limestone group.

19.b.2.3 Hadley Valley

For Hadley Valley, nearly the entire area is designated low to moderate probability with only a small area of low probability located in the South Fork Zumbro River valley. There are no sinkholes mapped by the MGS in the Hadley Valley area.

19.a.3 Sensitivity to Pollution

The *Geologic Atlas* maps the sensitivity to pollution of the water table aquifer. The water table aquifer can occur in sand and gravel deposits along river valleys and terraces, in the upper carbonate group (Galena Group), or in the St. Peter-Prairie du Chien-Jordan aquifer. The St. Peter-Prairie du Chien-Jordan is the aquifer that the City primarily uses to obtain water for municipal use. Private wells may obtain water from sand and gravel surficial glacial or river deposits, from the upper carbonate group, or from the St. Peter-Prairie du Chien-Jordan aquifer.

The MGS map indicating the aquifer's sensitivity to pollution is based on several assumptions, and is to be used as a general gauge of the overall susceptibility to pollution based on the travel time of pollutants from a surface source to the water table aquifer. A shorter anticipated time of travel translates into a higher sensitivity rating for the aquifer. This is a function of the karst and sinkhole conditions in the area, the presence of shallow limestone bedrock of the Prairie du Chien Group (less than 25 feet of soil overburden), and the presence of permeable soils along the watercourses.

The overall Project Area covers the entire sensitivity range from low to very high. The ratings are defined as:

- Low - contaminants may not reach the water table for decades or longer due to the presence of layers of fine grained material that are thick and laterally persistent.
- Low moderate - contaminants may not reach the water table for more than a decade.
- Moderate - contaminants may reach the water table in about a decade.
- High-moderate - contaminants may reach the water table in several years to a decade.
- High - contaminants are likely to reach the water table in weeks to years and little natural protection exists to retard the vertical movement of liquids.
- Very high - contaminants may reach the water table in hours to months.

19.a.3.1 Kings Run

In the Kings Run area, the sensitivity ratings also range from low to very high. The west side of the area is low to low-moderate in the sediments that fill the bedrock valley. The east side of the area is rated high-medium to very high in the shallow water table found along the South Fork of the Zumbro River and its tributaries.

19.a.3.2 Northwest Territory

In the Northwest Territory, sensitivity ratings range from low to very high. The west side of the area is dominated by low to moderate-low ratings where the water table is in the sediments that fill the buried bedrock valley. In the northeast and east sides of the Northwest Territory, small tributary streams of the South Fork Zumbro River have eroded valleys where the water table is much closer to the ground surface and the sensitivity ratings increase to high-moderate to very high.

19.a.3.3 Hadley Valley

In the Hadley Valley area, the sensitivity ratings range from high-medium to very high. The valley of Hadley Creek is rated high because of the shallow water table in the St. Peter-Prairie du Chien-Jordan aquifer. The steep side slopes of the valley are rated only high-moderate due to the greater depth to the water table and because of the low permeability Decorah shale. The high plateaus are rated as high to very high due to the shallow groundwater table in the upper carbonate group (Galena Group).

19.a.3.4 Potential Impacts and Mitigation Measures

During RWRP construction and trunk sewer extension construction activities, care will be taken to avoid spills of controlled substances such as diesel fuel and hydraulic fluid. Any spills that occur will be cleaned up quickly, in accordance with regulatory requirements. Construction contractors will be required by the City to develop spill response plans and to make all project personnel aware of the response plan requirements, including notification to the MPCA/State Duty Officer, if necessary.

Another concern is the potential for the sewer trench to act as a barrier or a conduit for ground-water flow. If the trench backfill material has a higher hydraulic conductivity than the surrounding soils, ground water will preferentially flow along the trench. Conversely, if the hydraulic conductivity of the trench backfill is lower than that of the surrounding soils, the trench could act as a barrier to ground-water flow. To minimize impacts of this nature, soils meeting appropriate engineering and environmental specifications will be used as trench backfill, and trench barriers will be used as necessary to sustain existing ground-water flow directions.

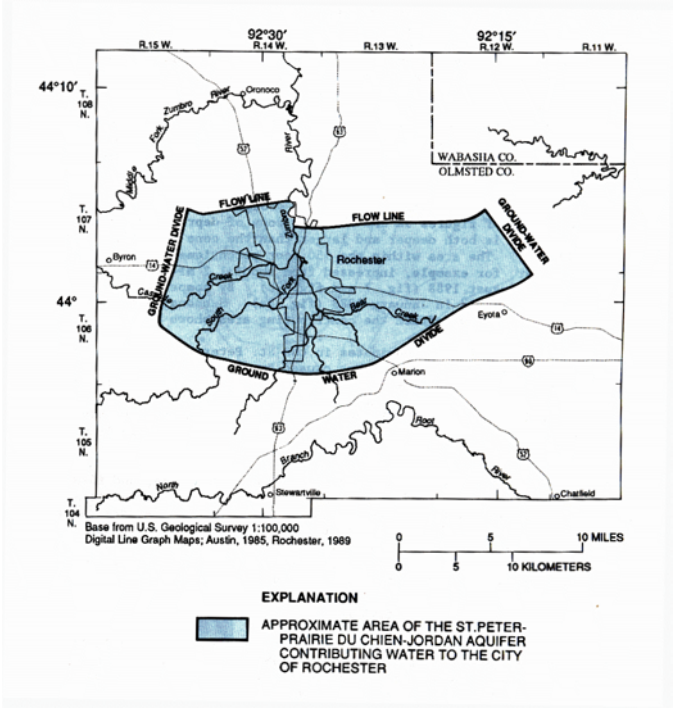
As noted previously, a portion of the trunk sewer conceptual alignments may be constructed using tunneling methods. The majority of the tunnel will be constructed in the Shakopee formation of the Prairie du Chien Group, which is primarily dolomite and is karsted in the Project Area. The tunnel will be constructed with secondary containment, such as a liner or grouted tunnel walls, to eliminate the potential for ground-water infiltration or the transmittal of potential leaks from sewer pipes.

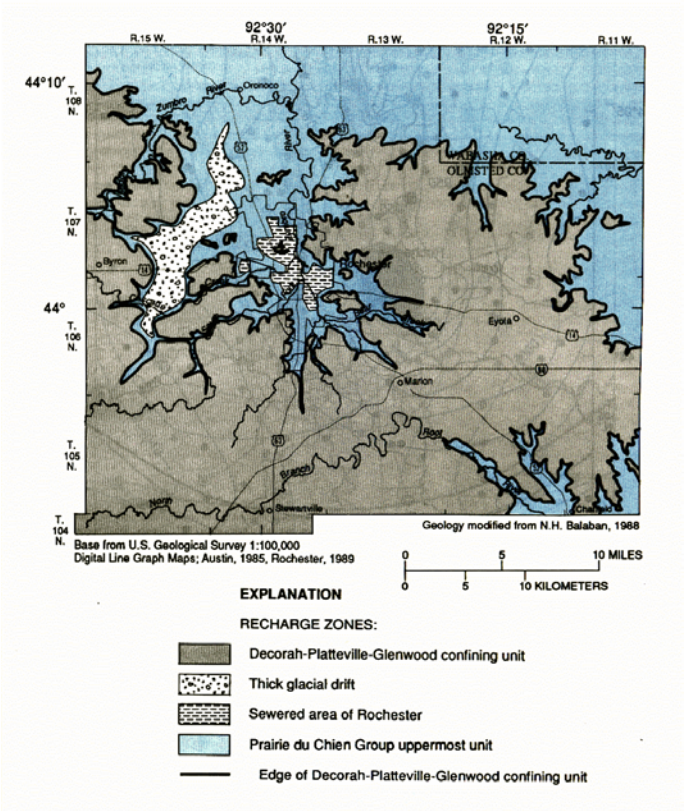
19.a.4 Ground Water Recharge Areas

In 1991, the U. S. Geological Survey (USGS) published a report, *Hydrogeology and Simulation of Ground-Water Flow in the Rochester Area, Southeastern Minnesota Water Resource Investigation Report, 1987-88* (USGS 1991). This report described the modeled area of ground-water contribution for the City and identified the five sources of recharge to the City's primary drinking water supply (the St. Peter-Prairie du Chien-Jordan aquifer) and estimated the percent contribution of each. In descending order of recharge contribution, the five sources are:

1. The edge of the Decorah-Platteville-Glenwood (D-P-G) confining unit (54 percent)
2. Direct infiltration from precipitation into the St. Peter-Prairie du Chien-Jordan aquifer where the confining unit is absent (26 percent)
3. Leakage from the City's storm sewer system (10 percent)
4. Leakage through the D-P-G confining unit (8 percent)
5. Leakage from the bedrock valley buried in glacial drift (2 percent)

The first schematic below and Figures 19-1 through 19-4 show the area of groundwater contribution to municipal wells. The contribution area identified is based on 1988 modeling and has not been updated to account for the most recent well additions. In a follow-up study, the USGS reported that there were no appreciable changes to the location in the ground water divide between 1988 and 1995 (USGS, 1997). The relative locations of the five groundwater recharge areas are shown in the second schematic below.





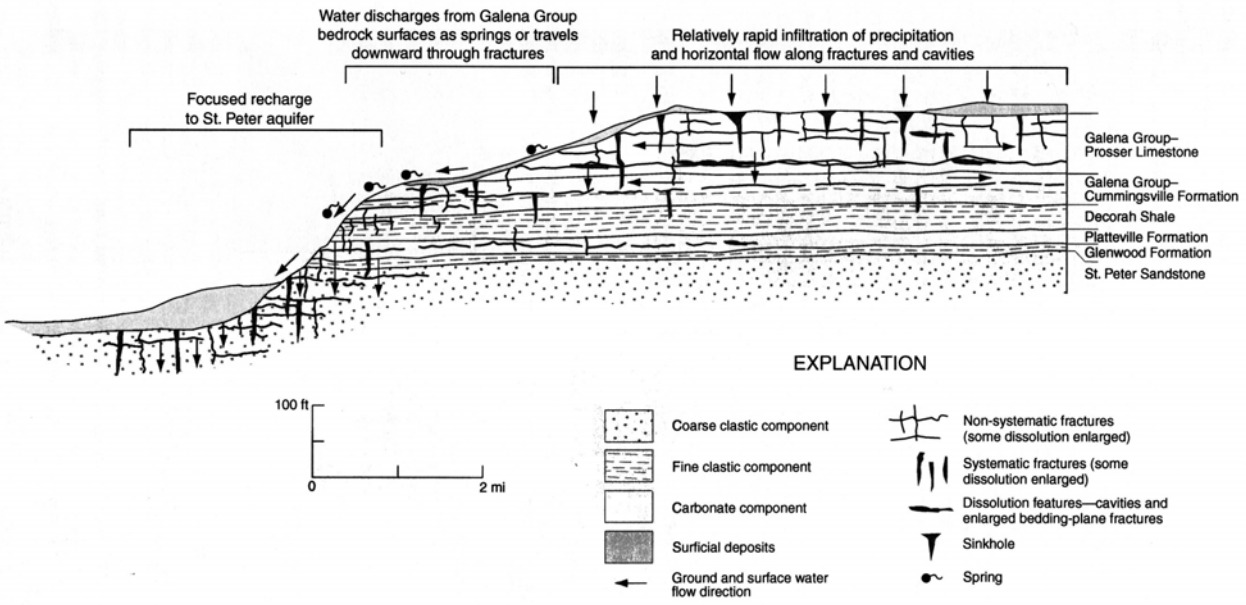
Source: *Hydrogeology and Simulation of Ground-Water Flow in the Rochester Area, Southeastern Minnesota, 1987-88,USGS Report 90-4081, USGS and City of Rochester, 1991.*

To better understand its drinking water aquifer, the City has been a partner in ground-water research projects totaling $1,100,000 since 1986. These studies have resulted in the publication of several technical papers and reports authored by technical experts, including registered professional geologists from the University of Minnesota, the MGS, the DNR, and the USGS.

Since the D-P-G confining unit, locally referred to as the "Decorah Edge", contributes the largest percentage of groundwater recharge within the area of groundwater contribution for the City, additional detail is provided below.

The discharge/recharge effect caused by fine clastic shales in the Cummingsville and the D-P-G units can be seen in the following schematic diagram. This diagram shows that ground water moves vertically through the Prosser Formation (limestone) until it reaches its solution enlarged outcrop edges or the Cummingsville Formation (limestone interbedded with shale). At these locations, ground water primarily moves laterally until it discharges at outcrops as springs or seeps within the surficial soil. This water flows along the land surface or through the surficial soils, proceeding downslope until it encounters vertical dissolution features at the outcrop edges of the D-P-G confining unit (shale and limestone interbedded with shale) or the underlying St. Peter Formation (sandstone), where it recharges the City's primary drinking water aquifer. The MGS divides Paleozoic bedrock in southeastern Minnesota into three principal hydrostratigraphic components. These three components can be associated with the process as discharge, flow, and recharge "zones":

- The carbonate component with low porosity and permeability (*focused discharge zone*, primarily Cummingsville and Cummingsville-Decorah contact outcrops).
- The fine clastic component with low porosity and permeability (a surface or near surface *flow zone* along the Cummingsville and D-P-G unit outcrops).
- The coarse clastic component with high porosity and permeability (*focused recharge zone* near the Decorah-St. Peter contact outcrop).



Source: *Hydrogeology of the Paleozoic Bedrock in Southeastern Minnesota, MGS Report of Investigations 61, University of Minnesota, 2003.*

This focused discharge/recharge area lies within several political jurisdictions: City, County and Townships. Less than 10 percent of it lies within the current City limits, and only about 30 percent currently lies within City's growth area.

Focused discharge/recharge areas likely occur in the Hadley Valley sewershed since this geologic setting surrounds the valley on the south, east, and north sides. Municipal well 37 is the only existing water supply well in the Project Area with time of travel zones that intercept this geologic setting.

The 1991 USGS report identified the area of ground-water contribution to the City's water supply. At that time, the northern boundary of the ground-water contribution area was south of the Hadley Valley area (Figure 19-3). As RPU installs additional wells north of this area (e.g., Wells 37 and 38), that boundary will shift further north, if the groundwater contribution area were modeled again to reflect these well additions. Focused discharge/recharge is not an important factor in the Northwest Territories or Kings Run areas, either because there is no upper carbonate group aquifer present or because the few areas with the D-P-G confining unit are buried under thick glacial sediments.

Focused discharge/recharge is not as important a factor in the Kings Run or Northwest Territory, either because there is no upper carbonate group aquifer present or because the areas with the D-P-G confining unit are buried under thick glacial till sediments. Based on a higher concentration of sinkholes along the edges of mapped till units, there is some speculation that there may also be focused discharge along the edges of the surficial till deposits to areas where bedrock is near the surface. However, with the evidence currently available, a determination of whether the till edge is a substantial component of the overall recharge to the City's groundwater system cannot be made (Runkel, MGS, E-mail Comm.12/10/98).

In July 2000, the *Rochester Groundwater Recharge Management Area (RGRMA) Project* (Olmsted County Environmental Services) was finalized. Here are some of the key findings:

- Due to steep slopes and wetness, Decorah Edge areas are generally not amenable to agriculture or development as compared to adjacent upland and lowland areas. However, as these areas are developed, the Decorah Edge areas can be targets for infill development and the next tier of urban and suburban subdivisions.
- There is a distinct correlation between the presence of hydric soils and the continuity and areal extent of the Cummingsville formation. In zones with a small areal extent of Cummingsville formation above the Decorah shale, wetland features are absent or limited in size.
- Hydric soils and wetland features identified in this hydrogeologic setting are often located on head slopes just below the Cummingsville-Decorah contact and on sideslopes at the base of the Decorah formation in the footslope area.
- Field observations suggest that the natural plant communities in these areas can be sensitive to minor disturbances of the tree canopy and drainage. With disturbance, sedge meadows appear to be displaced by reed canary grass and the woodland understories displaced by buckthorn. Residential development generally results in a conversion to short-rooted turf grasses, ornamental shrubs, and widely spaced trees.
- The level of information detail for geology and soils available at the start of the *RGRMA Project* was generally inadequate to use in locating hydrogeologic features, in predicting water related problems, or in developing the model GDPs that were part of the *RGRMA Project*. The development of the model GDPs incorporated more detailed mapping of geology and soils.

Additionally, the *RGRMA Project* report addressed development issues related to foundation failures, infrastructure challenges, hydraulic failures in septic systems, unnecessary hydraulic loading of the RWRP from basement sumps, soil instability, and lack of geologic knowledge by the engineering community and home buyers. These issues are also manifested in other geologic settings within the urbanized area where clay tills and/or shallow groundwater are present.

Current agricultural land uses in the secondary growth areas are the primary contributors of the nitrate loading in the upper aquifer through fertilizer application, feedlots, and leaking septic tanks. The last two features are also known sources of fecal coliform bacteria contamination (*Regional Total Maximum Daily Load Evaluation for Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin*, MPCA, August 2002; *Regional Total Maximum Daily Load – Study of Fecal Coliform Bacteria Impairments in the Lower Mississippi River Basin Implementation Plan,* MPCA, October 15, 2003). A map of feedlots is included in Appendix E. The nature and extent of contamination associated with urban land uses differs from agricultural uses. Accordingly, different BMPs are used to prevent and reduce contamination potential, particularly through stormwater management techniques. Without proper planning, urban development may also contribute to a reduction in ground water infiltration as impervious areas are increased. Additionally, changes in plant community types or the amount of vegetative cover may affect the filtration or attenuation benefits.

19.a.5 Ground Water Protection

Pollution prevention is the most effective means of protecting ground water supplies from all five recharge sources. Both agricultural and urban pollution sources will need to be addressed on a watershed basis to limit pollutant inputs. A regional consortium of agencies dedicated to water quality improvement and protection, known as the Basin Alliance for the Lower Mississippi in Minnesota (BALMM), has developed a Basin Scoping Plan to guide such efforts in this region. As a result, this region was the first to develop a Regional TMDLs for fecal coliform bacteria and its associated waste load allocations. Projects are also underway to help unsewered communities evaluate wastewater treatment options, assist farmers in developing and implementing water-protective BMPs specific to karst areas, and submit grants to provide various types of technical and educational assistance to farmers in support of BALMM objectives. One of the primary funding efforts to date has been the preparation and submittal of an application to the United States Department of Agriculture (USDA) for a Southeastern Minnesota Conservation Reserve Enhancement Program that would provide

opportunities to protect environmentally sensitive areas, including groundwater recharge areas. Although the City has little control over agricultural and rural aquifer inputs, the City has been supporting BALMM efforts. Most recently, the City Council passed a resolution in support of the Southeastern Minnesota Conservation Reserve Enhancement Program application and lobbied for Congressional support of funding this program. More information on BALMM activities can be seen on their Web site: http://www.umbsn.org/news/balmm_updates.shtml.

The City is also engaged in a Water Quality Protection Program to replace failing septic systems in older suburban subdivisions surrounding the City. Using $22.5 million in local option sales tax money, the City prioritized areas according to environmental susceptibility and, through voluntary petitions for services, is extending municipal sewer and water service to approximately 1,500 homes.

With the understanding that urban environments can also contribute to unwanted groundwater quality impacts, groundwater protection is also an objective of the City's Stormwater Management Plan. Specifically, the Stormwater Management Plan recommends the use of BMPs that:

- Protect ground-water quality and quantity by allowing for passive treatment and infiltration of stormwater.
- Promote ground-water recharge by creating additional ponding areas.

Since 1997, over 150 stormwater management ponds have been constructed to meet these objectives. Additionally, the City's SWPPP Program requires the distribution of educational materials about stormwater management. Because the karst area of Rochester provides opportunities for direct communication of surface and ground-water resources in many settings, any educational information provided to meet this requirement complements the ground-water protection messages provided by other agencies, including MPCA, MDH, and RPU.

Along outcrops of the Cummingsville and D-P-G units,, groundwater from the overlying limestone aquifer discharges to the surface. Water from these seeps and springs moves on the land surface or through the surficial soils before re-entering the underlying St. Peter-Prairie du Chien-Jordan aquifer. Nitrate and bacterial pollution evident in the upper carbonate aquifer is reduced or absent from the lower aquifer. Many mechanisms may be accounting for this change in water chemistry: oxidation or other chemical reactions, vegetative uptake, soil attenuation, or even dilution in the lower aquifer. RPU is currently undertaking a study in cooperation with the USGS to evaluate changes in ground-water geochemistry as it moves across the confining unit in hopes of identifying the mechanisms contributing to this observation. Recharge into the St. Peter sandstone below the confining unit is not homogenous along the outcrop. At this time, there are no field-tested, accurate predictors of the location of the most significant recharge areas.

A lack of understanding about hydrogeologic settings and their associated construction impacts has led, in some cases, to foundation failures, infrastructure installation challenges, and wetland alteration at urban developments within the City and suburban developments in the surrounding townships. Beginning with the publication of the *Olmsted County Geologic Atlas* in 1988, followed by the passage of the WCA in 1991, and the subsequent incorporation of the City's stormwater management requirements in the *Rochester Code of Ordinances*, understanding of hydrologic and hydrogeologic site conditions and their related impacts has steadily increased, along with the sophistication of developers, design engineers, home builders, environmental professionals, City staff and City officials, and the general public. In addition to the educational and regulatory mechanisms already in place, there are also several market forces that are even stronger incentives to developments to protect environmentally constrained areas:

- Cost; the added cost of wetland delineation and mitigation, constructing basements needing permanent sumps in areas with high water tables, re-grading steep slopes or of bedrock excavation, has led to alternative design and construction approaches.

- Timing; the additional time needed to address environmental regulatory requirements (e.g., wetland, shoreland, floodplain, stormwater, and EAWs) on top of the time consuming GDP process can contribute to the decision to avoid environmentally sensitive areas to expedite acceptance of a development proposal. Added time can also be a factor when neighborhood compatibility is an issue.
- Competition; non-local developers have spawned projects that demonstrate the economic viability of alternative development styles.
- Buyer demand; as environmentally conscious development approaches are placed on the market, buyer demand confirms the public desire for integrated environmental features, especially open spaces.

Although there are still exceptions and unfavorable practices have not been completely eliminated, the development community overall has responded in positive ways to avoid, minimize, and mitigate environmental impacts of all sorts. Most commonly, developers are creating public and private outlots or environmental corridors that preserve environmental features or integrate them with stormwater management or recreational features.

As described earlier, one concern is the potential for utility trenches and roads to act as barriers or conduits for ground-water flow. These effects can be minimized or mitigated with proper identification of hydrogeologic conditions and engineering. If the trench backfill material has a higher hydraulic conductivity than the surrounding soils, ground water will preferentially flow along the trench; conversely, if the hydraulic conductivity of the trench backfill is lower than that of the surrounding soils, the trench could act as a barrier to ground-water flow. To minimize impacts of this nature, soils meeting appropriate engineering and environmental specifications will be used as trench backfill, and trench barriers will be used as necessary to sustain existing ground-water flow directions.

Olmsted County is currently evaluating the need for a "Decorah Edge Overlay Zone" (DEOZ) ordinance. The intent of the DEOZ regulations is to guide development in the vicinity of the Decorah Edge in order to minimize foundation and basement problems for future residents of homes constructed in the DEOZ, to protect water quality and quantity recharging the aquifers relied on for potable water supply, to prevent extraordinary public expenditure for remediation of damage to public infrastructure, and to protect the scenic and environmental quality of Decorah Edge settings and associated hillsides, wooded areas, and wetlands; all of which promote the public health, safety and general welfare. Olmsted County staff has prepared a draft DEOZ ordinance. The draft ordinance will be discussed with area consultants and builders in early 2004, with the intent of appearing before the County Board in March 2004 to request initiation of the process to amend the Olmsted County ordinances. City staff has been involved in the review and development of the County's DEOZ Ordinance.

City staff has also been meeting over the past year to discuss whether a DEOZ is appropriate for the City and, if so, what form such an ordinance will take. Regardless of whether this approach is identified as the most viable and protective, the City will proceed to develop formal measures to assess the potential ground-water impact risks associated with the D-P-G confining unit for each proposed development in the Hadley Valley sewershed before such development proposals are approved. Additionally, RPU staff are expected to be identifying and implementing their Wellhead Protection Program Phase 2 implementation measures in the same time frame. In the interim, the City relies on education, existing regulations, and City, County, and State agency staff recommendations as part of EAW and GDP reviews to protect surface and ground-water resources.

19.b Soils

Describe the soils on the site, giving NRCS (SCS) classifications, if known. Discuss soil granularity and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

The Project Area contains six soil associations, each with a distinct pattern of soils, relief, and drainage. Typically, one or more major soils and some minor soils make up the following associations:

- Racine-Floyd-Maxfield association.

- Rockton-Chanahorn-Atkinson association.
- Dickinson-Plainfield-Kalmarville association.
- Mt. Carroll-Marlean-Arenzville association.
- Timula-Port Byron association.
- Mt. Carroll-Otter-Joy association.

The Racine-Floyd-Maxfield association consists of silty soils on uplands and in upland drainage ways. Local relief between drainageways and summits is about 20 to 50 feet, with slopes ranging from 0 to 18 percent. This association is present in the northernmost portion of Kings Run, much of the Northwest Territory, and Hadley Valley may include a very minor amount in its most southeasterly limit.

The Rockton-Chanahorn-Atkinson association consists of nearly level to sloping well-drained loamy soils on uplands. These areas are dominated by soils formed in a loamy mantle and in the underlying clayed residuum over bedrock. This association is generally on broad uplands that have slopes of 0 to 12 percent, dissected by deep drainage ways. This association occurs in the most northerly portion of the Northwest Territory and in Hadley Valley.

The Dickinson-Plainfield-Kalmarville association consists of soils that are nearly level to very steep, well-drained to poorly drained soils that are loamy on outwash terraces and silty on flood plains. This association is on terraces, foot slopes and flood plains in stream valleys. Slopes range from 0 to 30 percent. This association is present along the stream corridors of the South Fork Zumbro River in the Project Area, including all three sewersheds.

The Mt. Carroll-Marlean-Arenzville association is areas dominated by soils formed in loess. These soils are nearly level to very steep, well-drained silty soils on uplands. This association is deeply dissected into narrow ravines and is present in all three sewersheds.

The Timula-Port Byron association is similar to the Mt. Carroll-Marlean-Arenzville association with soils that are well drained on upland summits and drainage ways. Slopes range from 0 to 30 percent. This association covers a major portion of Kings Run and is present to a lesser degree in the Northwest Territory.

The Mt. Carroll-Otter-Joy association has been formed in loess. It consists of nearly level to moderately steep, well-drained, very poorly drained, somewhat poorly drained silty soils on uplands and in upland drainageways. It occurs in Hadley Valley, to a lesser degree in the Northwest Territory, and a very minor amount may be present in the most westerly portion of Kings Run.

The table in Appendix C identifies the USDA soil classifications for soils that are found within the Project Area and related slope, erodability, and permeability information. The permeability of a soil is estimated on the basis of soil characteristics such as soil structure, porosity, and gradation or texture that influence the downward movement of water in the soil. For example, granular soils with higher sand and/or gravel content are typically more permeable that soils that have more clay content. Steep slope soils and highly erodable soils may have a greater potential for sediment erosion. Special precautions will be taken in areas containing these types of soils to decrease the amount of erosion. Once construction is complete, these areas will be vegetated and permanent erosion control measures will be implemented to stabilize the soils. Highly erodable soil designations and slopes associated with each soil classification are also provided in Appendix C. The *City of Rochester Code of Ordinances* regulates development on bluffs and steep slopes. Bluffs are typically considered to consist of slopes greater than 18 percent and steep slopes are typically those with slopes greater than 12 percent and less than 18 percent. Development is not recommended or is described as poorly suited on steep slopes and not allowed within a specified distance from bluffs unless appropriate design or construction methods are approved.

During RWRP construction and trunk sewer extension construction activities, care will be taken to avoid spills of controlled substances such as diesel fuel and hydraulic fluid. Any spills that occur will be cleaned up quickly and according to applicable regulations. Construction contractors will be required to develop spill response

plans and to make all project personnel aware of the response plan requirements, including notification to the MPCA/State Duty Officer, if necessary.

20.0 SOLID WASTES, HAZARDOUS WASTES, STORAGE TANKS

20.a Solid and Hazardous Waste

Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

20.a.1. RWRP Expansion

During RWRP Expansion, several tons of construction and demolition debris will be generated through pavement removal, abandonment of existing facilities, and other construction related activities. All such demolition debris will be disposed of at a permitted facility in accordance with Minnesota Solid Waste Rules. Animal manure, ash, and hazardous waste will not be generated as part of the RWRP Expansion.

Biosolids sludge is a product of the treatment process. Three new sludge storage tanks will be added, one with each phase of RWRP Expansion. Sludge is currently hauled from the RWRP by truck and land applied to agricultural land as a soil amendment in accordance with USEPA regulations in 40 CFR, Part 503 and Minn. R. ch. 7041. As the RWRP expands and more biosolids are produced, the City will purchase or contract for more land to provide additional biosolids land application capacity.

20.a.2 Trunk Sewer Extension

During trunk sewer extension activities, several tons of construction debris will be generated through pavement removal and other construction related activities. All such demolition debris will be disposed of at a permitted facility in accordance with Minnesota Solid Waste Rules. Animal manure, ash, sludge and hazardous waste will not be generated as part of the trunk sewer extensions.

20.a.3 Secondary Development

Animal manure, sludge, and ash are not expected products from future residential, commercial or industrial entities in the Project Area. Only construction debris is expected as a byproduct of development construction projects. Once new homes and businesses are built in the Project Area, municipal solid waste (MSW) is expected to be the primary waste stream of both entities. Household hazardous waste (HHW) is likely to be produced by homeowners and the types of businesses most apt to be attracted to this area will most likely be classified as Minimal Hazardous Waste Generators (MGs) or Very Small Quantity Hazardous Waste Generators (VSQGs). Services, trade and light manufacturing dominate employment in Olmsted County.

Olmsted County is the local authority for solid waste management. Olmsted County has an established and nationally recognized integrated solid waste management system. Their system is comprised of: a waste reduction program, curbside recycling, rural recycling sheds (for residential drop-off), a recycling center, a hazardous waste facility (for problem wastes, special wastes and hazardous wastes from households, MGs, VSQGs), an MSW waste-to-energy combustion facility, and the Kalmar Landfill (which has separate cells for

the disposal of MSW, construction and demolition debris, and ash residue from the combustion of MSW, coal and medical waste). Two major hauling companies handle collection of MSW and recyclables: Superior Services and Waste Management. These firms contract with Olmsted County to dispose of the MSW they collect at Olmsted County facilities. These firms may market the recyclables they collect to any destination. Construction and demolition debris may be taken to any appropriately permitted landfill and is commonly exported to facilities in Iowa, Wisconsin, and elsewhere in Minnesota. Solid waste is regulated under *Olmsted County Solid Waste Ordinance No. 10*.

According to the Olmsted *County Solid Waste Division 10-Year Management and Business Plan - Waste Forecasting Report* (Wenck Associates, Inc., and Sebesta Blomberg and Associates, Inc. September 2001), waste generation rates for 1998 were 0.625 tons/person/year for the residential waste stream and 0.986 tons/employee/year for the commercial/industrial waste stream. Recyclable materials generation was 0.270 tons/person/year in 1998. Hazardous waste management rates for 2001 were calculated to be 0.003 tons/person/year. The Hazardous Waste Facility participation rate for Olmsted County households is approximately 15 percent, one of the highest rates in the state. Given the fact that households typically utilize the Hazardous Waste Facility only once every 2.4 years, Olmsted County staff estimate the effective capture rate of HHW to be about 36 percent of the County's households.

Olmsted County has forecast a range of MSW generation rates over the next ten years, based on population and employment projections. This data is being used to develop plans for facility and program expansion. At this time, Olmsted County is in the planning stages for a two-pronged approach to enhance waste management: increased promotion of waste reduction, recycling and hazardous waste management programs and plans to add a third combustion unit to the waste-to-energy facility. The Kalmar Landfill has a potential site life of 74.7 years for MSW. Olmsted County's objective is to insure that all segments of the solid waste stream have viable and appropriate destinations for disposal and management. Furthermore, Olmsted County will continue to support the expansion of its MSW facilities so that all MSW generated in Olmsted County can continue to be managed in an environmentally and fiscally sound manner within Olmsted County.

TABLE 20-1
SUMMARY OF FUTURE WASTE GENERATION

Residential Waste Generation Rates	Estimated Future Population Growth	Estimated Increase in Future MSW Generation
0.625 tons MSW[1]/person/year	117,700	73,563 t/p/yr
0.270 tons recylables/person/yr	117,700	31,779 t/p/yr
0.003 tons HHW[2]/person/yr	117,700	353 t/p/yr

[1] MSW = municipal solid waste.
[2] HHW = household hazardous waste.

20.b Toxic and Hazardous Materials.

Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

Area sensitivity to groundwater to pollution is discussed under Section 19.a.3 of this EAW.

20.b.1 RWRP Expansion

The RWRP uses chemicals that are common to the to the wastewater industry, including chlorine (RWRP Risk Management Plan 1999). The Risk Management Plan also addresses risk prevention measures. Chlorine is used to continuously disinfect RWRP discharge. The RWRP neutralizes (through dechlorination) the chlorine in its discharge prior to discharging to the South Fork of the Zumbro River. Chlorine is stored in 2,000-pound cylinders on site. To ensure that disinfection is not interrupted when changing chlorine cylinders, it is common in the wastewater industry to have multiple cylinders connected at one time. Once a cylinder is exhausted, the system automatically switches over to the back-up cylinders. Because more than one cylinder is hooked up at a time, the process is considered to have greater than 2,500 pounds of chlorine at one time, as a result, chlorine is regulated under the RWRP's Risk Management Plan. This process will continue after RWRP Expansion occurs.

Although the RWRP uses other chemicals, including corrosives, such as alum and ferric chloride, none of them are used in quantities above regulated threshold quantities.

Flammable substances stored in quantities equal or greater than 10,000 pounds are also cover by Risk Management Plan regulations. Although the RWRP stores methane, a byproduct of wastewater solids digestion, it does not have the capacity to store enough to be regulated.

As RWRP flows and loads increase there may be incremental increases in the use and storage of chemicals and flammable gases. Any increases will meet required regulations pertaining to reporting and be addressed in future Risk Management Plans for the facility, including the discussion of risk prevention.

20.b.2 Trunk Sewer Extension

No above or below-ground tanks will be used in the trunk sewer extension projects, with the possible exception of truck-mounted aboveground tanks used by contractors for refueling construction equipment. Construction contractors will be required to develop spill response plans and to make all project personnel aware of the response plan requirements, including notification to the MPCA/State Duty Officer, if necessary.

20.b.3 Secondary Development

Commercial nodes allowed in residential areas under the development scenario and areas zoned for light industrial/commercial use will allow for gas tanks at service stations. Other tanks related to commercial and light industrial use could be needed, but cannot be specifically identified as to type and/or location at this time.

21.0 TRAFFIC

Parking Spaces Added NA Existing Spaces NA
Estimated total average daily traffic generated 850,000 vehicle trips based on secondary development in the Project Area.
Estimated maximum peak hour traffic generated and its timing NA

Provide and estimate the impact on traffic congestion affected roads and describe any traffic improvements necessary.

21.a RWRP Expansion

21.a.1 Construction Traffic

All construction materials, bulk materials, and equipment for the RWRP Expansion will be delivered by truck. These vehicles are anticipated to vary in size from mid-size trucks to full size semi-trucks carrying up to the maximum legal load. Some vehicles will make multiple trips to the site on a daily basis, especially those that deliver construction materials or remove excavated soils or demolition debris.

The primary routes for construction related vehicles are TH 52, CSAH 22 (Circle Drive), and County Road (CR) 133 (West River Parkway). Existing traffic volumes on these corridors are 38,500 vehicles per day (vpd), 20,800 vpd, and 10,400 vpd, respectively. The existing roadway capacities are expected to handle the relatively small amount of additional traffic. However, construction vehicles turning into and out of the RWRP site may impact traffic flows on adjacent roadways to a moderate degree. The access to the RWRP is in good condition and should not require replacement or improvement. Necessary and appropriate traffic warning devices will be used during construction.

21.a.2 Operational Traffic

It is currently anticipated that the fully expanded RWRP will only require one or two additional employees. During the peak sludge hauling season, when sludge is hauled for application to agricultural fields, it is estimated that 300 truck round trips a week will be made. This usage would increase incrementally as RWRP flows and loads increase at an estimated rate of 1.5 percent per year. The resulting increase in traffic related to both added employees and sludge hauling is minor and will not require roadway improvements.

21.b Trunk Sewer Extension Construction Traffic

During trunk sewer extension construction, varying numbers of vehicles will be involved in excavation and construction activities. Impacts on traffic flow will be minor, site-specific, and short-term. Necessary and appropriate traffic warning devices will be used during construction.

21.c Secondary Development Traffic

To prepare this EAW, a traffic study was completed for the Project Area to analyze and document the expected traffic impacts of potential future land development in the Project Area. Study tasks included the identification of the existing roadway and intersection characteristics, estimation of future roadway and intersection deficiencies, recommendation of mitigation strategies, and development of planning guidelines. The technical memorandum entitled *Secondary Traffic Impacts Rochester Water Reclamation Plant Expansion - Trunk Sewer Extension To Kings Run, Northwest Territory, And Hadley Valley* (Appendix F) is available at http://www.rochestermn.gov/publicworks/wrp or http://www.pca.state.mn.us/news/eaw/index.html#open-eaw.

21.c.1 Existing Conditions

Twelve key roadways (broken into thirty-two segments for analyses) and twenty-one key intersections were selected for this traffic study because they will provide primary access to the regional road system and will likely be the primary roadways when the area develops. These key roadways and intersections are listed in the traffic technical memorandum referenced above (Appendix F) and can be seen in Figure 21-1.

Currently, most of the Project Area roadways are two-lane paved facilities. Traffic volumes range from 680 to 7,500 vpd. All existing intersections are controlled with STOP signs. Existing land development is limited, consisting mostly of grasslands, agricultural land, and farmsteads.

21.c.2 Future Conditions

This study evaluates the traffic impacts of the development of approximately 11,439 acres as indicated by Table 9-1. The growth areas evaluated are Kings Run, Northwest Territory, and Hadley Valley. The traffic analysis assumed a hypothetical "worst case" scenario of full land development in the entire Project Area by Year 2035.

Traffic volumes for Year 2035 were generated using Rochester-Olmsted County Council of Government's (ROCOG) Travel Demand Model. Land use in the Project Area at full build-out added an additional 700,000 daily vehicle trips (for a total of 850,000) to the roadway network. Average daily traffic (ADT) numbers ranged from 11,100 to 52,100 vpd. Left turn movements in some cases were as large as 1,310 vehicles during the PM peak hour.

Projected ADT volumes, existing roadway geometry, and existing traffic controls were used to estimate a level of service (LOS) for each key roadway and intersection. LOS is a recognized standard used by traffic engineers to estimate the quality of traffic flow, or level of congestion on a roadway or at an intersection. The results of a LOS analysis are typically presented in the form of a letter grade, A through F. Much like an academic report card, LOS A represents conditions with "free-flow" traffic, while LOS F conditions represent considerable congestion with long delays and queuing.

Although LOS A conditions represent the best possible level of traffic flow, it is not financially feasible to build urban roadways and intersections to such high standards. Therefore, in the Rochester area, ROCOG has set the index of congestion for major urban roadways and intersections at LOS C/D and secondary roadways and intersections at LOS D/E. This index indicates that LOS C conditions during the peak hour of traffic will be considered acceptable for major urban roadways and intersections, whereas LOS D conditions will be considered congested and deficient. Likewise for secondary roadways and intersections, LOS D conditions during the peak hour of traffic will be considered acceptable, whereas LOS E conditions will be considered congested and deficient.

Roadway operations were evaluated by comparing ADT counts with level of service bar charts developed using methodologies from the Transportation Research Board Highway Capacity Manual. Intersections were evaluated using estimated PM peak hour critical movements. Assuming existing geometry, all roadway segments performed at LOS F, indicating congested conditions. Thirty (out of a total thirty-one) intersections operated below the desired level of service.

An operational analysis was completed for key intersections using estimated PM peak hour critical movements. Sixteen (out of a total twenty-one) intersections operated below the desired level of service.

21.c.3 Potential Future 65th Street NW Interchange

The *65th Street NW Interchange Justification Request* was completed by ROCOG and the City in July 2003. The study documents the traffic impacts of a folded diamond interchange at the junction of TH 52/65th Street NW and compares the results to an overpass scenario. Because the future 65th Street NW Interchange with TH 52 is not currently funded, this EAW study evaluated worst-case traffic and roadway impacts based on the 65th Street NW interchange not being constructed. If this interchange is funded and constructed in the future, it would likely reduce some of the expected traffic impacts and roadway improvements described in the Mitigative Strategies section of this EAW. The main traffic changes expected with a 65th Street NW Interchange are as follows:

- A reduction in traffic volumes is expected on south ramps of the 55th Street NW interchange.
- A reduction in traffic volumes is expected between the east ramps and the east frontage road on 55th Street NW.
- A reduction in traffic volumes is expected on Bandel Road between 55th and 65th Streets NW.
- An increase of traffic volumes is expected on the TH 52 mainline between 55th and 65th Streets NW.

The study noted that the 55th Street NW interchange could experience deficient operations if 65th Street NW is only an overpass of TH 52. According to the study, the reduction in traffic on 55th Street NW due to the 65th Street NW interchange will improve operations along 55th Street NW to LOS C. The magnitude of roadway improvements to 55th Street NW will likely be lessened by the addition of an interchange at TH 52 and 65th Street NW because of the traffic diversion to that interchange.

As mentioned previously, for this EAW study the operations analysis was completed using a scenario that assumed an overpass at TH 52/65th Street NW intersection. For comparison purposes, the ROCOG Travel Demand Model was run for Year 2035 using the full build-out scenario (including Kings Run, the Northwest Territory, and Hadley Valley) and a 65th Street NW interchange. It should be noted that traffic volumes documented in the *65th Street NW Interchange Justification Request* only included full build-out of the Northwest Territory.

The results of this analysis were consistent with that shown in the Interchange Justification Report. Additionally, traffic volumes increased (53,400 vpd to 57,200 vpd) on 65th Street NW west of TH 52 and decreased (26,500 vpd to 23,900 vpd) on Overland Drive. However, these changes have minimal impact on the roadway operations. For both scenarios, 65th Street NW is expected to operate at LOS D between 50th Avenue NW and TH 52 if constructed as a 6-lane arterial. Overland Drive is expected to operate at a LOS C as a 4-lane arterial.

Additional intersection analysis was completed on 65th Street NW and Overland Drive. Impacts of the interchange to 50th Avenue NW/65th Street NW and CR 112 (18th Avenue NW)/Overland Drive are negligible. Both will remain at LOS C with turning lane improvements and the recommended roadway geometry. However, the additional traffic generated by the development within the Kings Run and Hadley Valley growth areas will impact operations near the 65th Street Interchange. The West Frontage Road/65th Street NW intersection is expected to operate at LOS D and the East Frontage Road/65th Street NW intersection is expected to operate at LOS E when constructed with dual left turn lanes.

21.c.4 Circle Drive Traffic and Access Management Plan

The *Circle Drive Traffic and Access Management Plan* was completed by Parsons Transportation Group in January 2002. Circle Drive is an expressway, forming a loop around much of the City. To improve the mobility of the Corridor, Olmsted County and the City developed intersection and roadway operational goals. In order to reach these goals, a one-half mile spacing of traffic signals is desirable to promote traffic progression. The study evaluates the existing and future operations on the Circle Drive Corridor, and makes recommendations to assist in achieving the performance goals. For purposes of this study, the recommendations for two intersections, West Circle Drive/55th Street NW and East Circle Drive/Rocky Creek Drive/Stonehedge Drive, were considered.

Tying in as the northwestern leg, 55th Street NW connects with West Circle Drive. At the intersection, 55th Street is a two-lane facility and West Circle Drive is a four-lane divided facility. The southeastern leg of the intersection provides access to a retail development. A traffic signal currently controls the intersection.

The *Circle Drive Traffic and Access Management Plan* recommends merging the existing 55th Street NW access with 48th Street NW, tying in to West Circle Drive about 1,000 feet southwest of the existing access. The north approach of the existing 55th Street NW intersection and median would be closed, allowing only right-in / right-out vehicular traffic to enter the retail development via the existing south approach. The new intersection is expected to require a traffic signal, operating at LOS C in Year 2025.

Long-range plans include the connection of Hadley Valley Road and Rocky Creek Drive via Stonehedge Drive NE at this intersection. This connection is a desirable location for ideal signal spacing and is forecast to operate at LOS B in Year 2025. In order to operate efficiently, the intersection will require turn lane improvements.

21.c.5 Mitigative Strategies

ADT volumes were used to estimate roadway cross-sections that will meet ROCOG's level of service guidelines. This analysis should be used for right-of way acquisition purposes only. More detailed study should be completed in the form of a corridor study at the time of development. Corridor studies are needed to determine the final cross-section and conceptual alignment of future roadway improvements. As a result of the traffic study, cross-sections recommendations were suggested for consideration when planning future improvements. Six-lane, four-lane, and three-lane cross-sections, all with right and left turn lanes, were identified at 20 roadway segments that are shown and listed in the traffic technical memorandum found in Appendix F.

Intersection analysis included determining where turn lanes and traffic signals will likely be needed. With the high PM peak hour turning movements, all intersections will require separate turn lanes. Additionally, all intersections except 60th Avenue NW/85th Street NW are expected to meet traffic signal warrants during the PM peak hour. Meeting traffic signal warrants indicates a high likelihood of needing traffic signals at these intersections in the future.

At full build out, traffic signal warrants will be met at twenty intersections listed in the traffic technical memorandum found in Appendix F. The recommended roadway cross-sections and traffic signal locations should be used at this time for estimating future right-of-way needs. Recall the Year 2035 development scenario examined is a hypothetical "worst case" scenario. It assumes the King's Run, Northwest Territory, and Hadley Valley growth areas will reach full build-out by the Year 2035. Development is expected to happen incrementally over the next 40 years. Therefore, implementation of all improvements is not expected by Year 2035. The timing and magnitude of the mitigations will be dependent upon the size, type, and location of the developments that occur each year both inside and outside of the Project Area. More detailed corridor studies are necessary to determine the design of potential improvements.

21.c.6 Functional Classification

- A properly designed, functionally classed roadway network will improve mobility and safety, while minimizing conflicts between land use and traffic speeds and volumes. In addition, the framework helps in the prioritization of roadway improvements and determination of access spacing and traffic control. Recommended spacing is two to three miles for principal arterials and one to two miles for minor arterials. Collectors should be spaced at one-half-mile spacing between arterials. The functional classifications assigned to existing and future Project Area roadways can be seen in Figure 21-1, as designated in ROCOG's Long Range Thoroughfare Plan (August 2003). For the purposes of this EAW, the functional classification designations were extended beyond the ROCOG plan limits to take into consideration future development throughout the entire Project Area. By placing these designations on these roadways now, access management guidelines and roadway design standards will be used as development occurs and roadways are planned and constructed.

21.c.7 Access and Traffic Signal Spacing

Adequate spacing between accesses and traffic signals is critical for providing safe and mobile travel. The City has developed Access Management Guidelines by functional classification. Recommended access spacing on expressways and arterials with projected traffic volumes over 15,000 vpd provides the most limitations at 1,200 feet between roadways. Local roadways provide the most access with recommended spacing between driveways and roadways of 35 feet.

In 2002, Minnesota Department of Transportation (MnDOT) established recommended signal spacing guidelines by functional class. For the Kings Run, Northwest Territory, and Hadley Valley growth areas, these guidelines are as follows:

- Principal Arterial – one-half mile
- Minor Arterial – one-fourth mile
- Collector – one-fourth mile

These guidelines should be considered when determining access and signal spacing of new roadway infrastructure needed to serve proposed development in the Project Area.

21.c.8 Mass Transit

One component of the ROCOG Long Range Transportation Plan is the Transit Development Plan (TDP). The TDP was initially adopted in 1977 and was updated in 1992. It addresses short term and long term transit service operation, expansion, and funding for regular route and dial-a-ride services in the City of Rochester and its environs.

A seven member Transit Advisory Committee (TAC) provides input and recommendations to the City Council on transit issues, including TDP updates. The capital portion of the TDP is updated annually, while the operations section is updated every two to three years. The TAC is also oversees an annually updated transit needs assessment, Prospective Public Bus Route Expansion Areas, that evaluates neighborhood density and ridership demand to set expansion priorities, which are then added as money becomes available. Additionally, the ROCOG Long Range Transportation Plan and TDP are currently undergoing a comprehensive update that will be complete by the end of 2004.

As an integral component of its transit system, the City provides several Park and Ride lots. Locations of the lots and the associated pick-up schedules can be viewed at www.rochesterbus.com. Currently, there are two lots serving commuters coming from the north. An additional northern City Park and Ride lot is planned for the southwest corner of the 75th Street NW/TH 52 intersection on MnDOT right-of-way as part of the TH 52 reconstruction project currently underway. All three of these lots could serve future residents of the Northwest Territory.

Two fixed route transit lines currently serve the developed portions of the Kings Run and Northwest Territory areas. No routes serve the Hadley Valley area at this time.

22.0 VEHICLE-RELATED EMISSIONS

Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. Note: If the project involves 500 or more parking spaces, consult *EAW Guidelines* about whether a detailed air quality analysis is needed.

Vehicle emissions associated with RWRP and trunk sewer construction and operation will not have a significant effect on air quality. During both RWRP and trunk sewer extension construction, varying numbers of vehicles will be involved in excavation and construction activities. These vehicles will have only short-term, negligible impacts on local air emissions. Based on the estimated addition of one or two employees at the RWRP after expansion few, if any, new parking spaces will be required at the site. However, residential and

other development enabled by the construction of wastewater conveyance capacity may result in measurable impacts resulting from vehicle-related emissions. In order to help alleviate air quality issues, roadway and traffic control improvements and provision of mass transit will be implemented as required to mitigate air quality impacts of increased traffic.

23.0 STATIONARY SOURCE AIR EMISSIONS

Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing), any greenhouse gases (such as carbon dioxide, methane, and nitrous oxides), and ozone-depleting chemicals (chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

23.a.1 RWRP Expansion

Based on an evaluation conducted in 1995, RWRP emissions fell below the potential to emit (PTE) level that would require an air permit. None of these emissions exceeded Part 70 or state permitting thresholds. The emission sources evaluated at that time included:

- Two 400 Kilowatt (kW) gas engine generators
- One 125kW standby generator
- Five boilers (Digester Sludge Heat Exchanger, Digester/Hot Water Boiler No.3, Maintenance Building Boiler No. 4, Digester Boilers Number 5 and 6)
- One 24 Million British Thermal Units (MMBTU)/hour flare
- Two fuel storage tanks

The composition of emissions, as totaled in 1995, was:

Sulfur dioxide (SO_2)	33 tons per year (tpy)
Volatile organic compounds (VOCs)	12 tpy
Particulate matter	5 tpy
Particulate Matter less than 10 um in size (PM_{10})	5 tpy
Lead	0 tpy
Oxides of nitrogen (NOx)	87 tpy
Carbon monoxide (CO)	80 tpy
Hazardous air pollutants (HAPs)	1 tpy
Single HAPs	0.5 tpy

Since the 1995 air emission evaluation, the City replaced one of the 400 kW gas engine generators with actual emissions of 36 tpy of NOx, and 28 tpy of CO, with a new, high efficiency 1000 kW gas engine generator with actual emissions of 26 tpy NOx and 26 tpy of CO. This engine replacement increased the gap between actual emissions and the PTE threshold requiring an air permit. It is possible that the other 400 kW gas engine generator may be replaced with a higher efficiency engine in the future, resulting in lower emissions as described in the previous paragraph. There are no plans for adding any additional engine generation capacity, which is main source of RWRP emissions. It is not clear at this time whether additional boilers will be needed as part of the proposed three phases of RWRP Expansion. An additional boiler or boilers may be added. Based on a review of current boiler emissions, the RWRP could double emissions from the current five boilers (worst case scenario), and still be under any threshold limit values. Current boiler emissions are 3 tpy of CO, 12 tpy of NO_x, 2 tpy of particulates, 2 tpy of PM_{10}, 27 tpy of SO_2, and 1 tpy of VOCs. The PTE threshold requiring a

permit would not be triggered even if boiler emissions were doubled. Doubling the flow would increase RWRP VOC emissions by 2 tpy and HAPs by 1 tpy. If and when replacement engines or additional boilers are installed, the City will update the PTE information. If air quality permit thresholds are exceeded the City will apply for an air permit, as required.

As described under section 20.b.1, the RWRP uses, and will continue to use, chemicals that are common to the to the wastewater industry, including chlorine (RWRP Risk Management Plan 1999). Methane, a byproduct of wastewater solids digestion is stored and used on site. Any increases will meet required regulations pertaining to reporting and be addressed in future Risk Management Plans for the facility, including the discussion of risk prevention.

Since RWRP emissions fall below federal Part 70 and state permitting thresholds, there are no plans for further pollution prevention techniques or air pollution control devices at this time.

Fugitive dust is discussed in the response to Question 24.

23.a.2 Trunk Sewer Extensions and Secondary Development

There are no known stationary source issues associated with the trunk sewer extensions. Stationary source issues are typically not associated with secondary residential development. There may be stationary source issues associated with secondary industrial or commercial development, but in the absence of specific GDPs, they cannot be predicted at this time. These issues would be addressed at the time of development in accordance with MPCA air quality regulations.

24.0 ODORS, NOISE AND DUST

Will the project generate odors, noise or dust during construction or during operation? ☒ Yes ☐ No

If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

The *City of Rochester Code of Ordinances* regulates noise and contains Local Industrial Performance Standards that regulate noise. There are no City ordinances for odor or dust control.

24.a.1 Noise

24.a.1.1 Construction-Related Noise

Typical construction equipment noise will be generated during RWRP and sewer construction, but contractors must abide by City noise ordinances. In particular, noise impacts from RWRP construction traffic should be negligible given the existing nature and volume of traffic on CSAH 22 and TH 52. In areas where noise-sensitive receptors (primarily residences) are close to construction, noise-limiting techniques will be implemented, such as scheduling construction during daylight hours. There will be no long-term noise impacts associated with ongoing operations or secondary development. There will be no long-term noise impacts.

24.a.1.2 Traffic-Related Noise

As a result of the RWRP Expansion and the subsequent development of the Kings Run, Northwest Territory, and Hadley Valley areas, traffic volumes and therefore, noise, are expected to increase. As secondary development occurs in the Project Area, new and existing noise receptors will be affected by traffic noise to

various degrees. Those receptors most affected will be adjacent to major roadways. TH 52 will carry the highest traffic volumes in the area and, therefore, can be expected to experience the most perceptible traffic noise increase.

MnDOT has conducted several noise analyses in conjunction with TH 52 reconstruction planning. In these, two types of noise abatement criteria were evaluated when quantifying traffic-related noise. A Decibels, as a time weighted average (dBA) is a unit of measure of sound level. The number of decibels is calculated as ten times the base-10 logarithm of the square of the ratio of the mean-square sound pressure (often referred to as frequency weighted), and the reference mean-square sound pressure of 20 μPa, the threshold of human hearing. The A-weighting network de-emphasizes the high (6.3 Kilohertz [kHz] and above) and low (below 1 kHz) frequencies, and emphasizes the frequencies between 1 kHz and 6.3 kHz, in an effort to simulate the relative response of the human ear. The Federal Highway Administration (FHWA) adopted a sound level of 67 dBA, Equivalent Sound Level (Steady A-weighted sound over a given period) (LEQ), for residential areas and 72 dBA, LEQ, for commercial/industrial areas. LEQ is the equivalent steady-state sound level that, in a stated period of time, contains the same acoustic energy as a time-varying sound level during the same period. Minnesota has adopted daytime sound levels of 65 dBA L_{10} for classification 1 (residential) areas and 70 dBA L_{10} for classification 2 (commercial/industrial) areas. The L_{10} is the sound level exceeded 10 percent of a specific time period. In general, Minnesota's noise abatement criteria are more stringent than FHWAs (Table 24-1). Any location along a roadway capacity improvement project that approaches or exceeds these thresholds should be investigated for feasible and reasonable noise abatement measures in the development of the project.

TABLE 24-1

STATE AND FEDERAL NOISE ABATEMENT CRITERIA

Noise Abatement Categories	Noise Abatement Criteria
Federal – Land Use Category B	67 dBA (L_{eq})
Minnesota - Classification 1 (Daytime)	65 dBA (L_{10})
Minnesota – Classification 2 (Daytime)	70 dBA (L_{10})

From 1994 to1996, noise levels along TH52 were quantified by monitoring a total of 131 sites in the TH 52 reconstruction corridor from CSAH 14 (Douglas Rd) to TH 63 and were reported in the Draft EIS (DEIS) and Final EIS (FEIS) prepared by the MnDOT and the FHWA. Future traffic noise levels were predicted with forecast year 2015 traffic volumes.

In 2002, an EAW was conducted by MnDOT as a result of a revised reconstruction proposal for TH52 in Rochester. Due to changes in traffic volumes and roadway design, another noise analysis was conducted. Existing (2000) and future (2029) noise levels were projected using the FHWA noise prediction model STAMINA 2.0, as modified for use by MnDOT. Noise projections were based on 2000 traffic counts and anticipated 2029 forecast peak hour daytime traffic volumes, vehicle speeds, mix of vehicles, roadway grades, and the distance from the roadway centerline to the receptor (horizontal and vertical). It was found that future noise levels would exceed both Federal Noise Abatement Criteria and State Noise Standards at many sensitive noise receivers.

The same representative noise receiver sites were analyzed in the FEIS and EAW, with the exception of one additional site added in the EAW to represent a new residential development in the area. Results of the noise analysis as presented in the DEIS and FEIS are as follows.

From 75th Street NW to 65th Street NW, the "build without abatement" scenario predicted daytime L_{10} noise levels ranged from 65 to 71 dBA. The "build without abatement" scenario predicted daytime L_{10} noise levels ranged from 64 to 65 dBA. The "build without abatement" noise level at two of the four receiver sites analyzed in this segment met or exceeded the federal abatement criteria while all four receiver sites met or exceeded the state noise standard.

From 65th Street NW to 55th Street NW, the "build without abatement" scenario predicted daytime L_{10} noise levels ranging from 63 to 72 dBA. The "build with abatement" scenario predicted daytime L_{10} noise levels ranging from 61 to 65 dBA. The "build without abatement" noise level of one of the five receiver sites analyzed in this segment met or exceeded the federal abatement criteria while four of the five receiver sites met or exceeded the state noise standard.

From 37th Street NW to 19th Street NW, the "build without abatement" scenario predicted daytime L_{10} noise levels ranging from 64 to 77 dBA. The "build with abatement" scenario predicted daytime L_{10} noise levels ranging from 61 to 75 dBA. The "build without abatement" noise level of 16 of the 30 receiver sites analyzed in this segment met or exceeded federal abatement criteria while 28 of the 30 receiver sites met or exceeded the state noise standard. A park and a hotel are among the 16 receptor sites that exceeded both federal and state abatement noise levels.

Noise analysis data collected for the MnDOT EAW indicated that noise levels had not changed significantly since the FEIS. The data also supported the modeling data for 2001 that had been presented in the FEIS, providing evidence that modeling results are similar (within 3 dBA) to actual noise levels in the MnDOT project area. Forty noise receptors analyzed in the EAW exceeded the federal noise abatement criteria. Of the 40 receptors, 11 are in areas that propose noise mitigation. For those receptors, the noise mitigation techniques (such as traffic management measures, alteration of horizontal and vertical alignment, noise barriers, or buffer zones) will reduce the noise levels, but the criteria would still be exceeded. Of the 40 noise receptors that exceeded the federal criteria, 29 receptors were in areas where noise mitigation was not proposed in the FEIS. As development within the RWRP Expansion – Trunk Sewer Extension EAW Project Area increases, these noise levels may increase due to higher volumes of traffic.

No additional noise modeling was conducted specifically for the RWRP Expansion-Trunk Sewer Extension EAW. When required by federal and state environmental assessment regulations, additional noise analyses will be conducted as planning commences for new road construction or existing road upgrades within the Project Area.

24.a.1.3 Noise Mitigation Approaches

Even with the implementation of noise mitigation measures to reduce traffic noise levels (such as traffic management measures, alteration of horizontal and vertical roadway alignments, noise barriers, or buffer zones), noise abatement criteria would still be exceeded along major roadways. As part of secondary development due to RWRP Expansion and trunk sewer extension, efforts will be made through local planning authorities to regulate future land development such that noise sensitive land uses are not located adjacent to major roadways or are planned and constructed in such a way that noise impacts are minimized. Furthermore, it is the policy of the City that prior to development, developers are required to grant the City a noise easement as a condition of their Development Agreement with the City in cases where noise impacts may be an issue. The Agreement requires the property owner to incorporate noise abatement designs into the permanent habitable buildings to be constructed on the property consistent with the Housing and Urban Development interior noise level standards established at no more than 45 dBA for interior spaces. The owner must also waive all future rights to request government provision of any noise abatement to serve the property related to the noise source. The owner must agree to dedicate a noise/air space easement in a form prepared by the City Attorney for the entire property.

Noise barriers, or noise walls, will be constructed at various locations along TH 52 within the Project Area. In urban areas noise walls are not universally practical due to the need to preserve access and adequate sight lines for safety. Additionally, some affected parties decline noise walls to maintain visual connectedness to the community or for aesthetic reasons.

24.b Odor

24.b.1 RWRP Expansion

Several measures have been incorporated into the RWRP Expansion design to help control odors. The primary clarifiers will be covered. In addition, a piped system will be included to rinse the primary clarifiers with flushing water each time one is removed from service. The primary effluent flow equalization basins will be covered as will all but one of the raw wastewater equalization basins. The uncovered raw wastewater equalization basin will be reserved for emergency use only and is not intended for normal operations. Aeration basins are covered and the process air, plus an allowance for sweep air, will be treated in two packed-tower scrubbers using a chlorine solution. A piping system will be provided to rinse the walls of each secondary clarifier with flushing water. Ventilation and odor scrubbing for the thickened digested sludge storage tanks can be provided via exhaust air from the two sludge storage tanks that is currently treated in Scrubber 5.

24.b.2 Trunk Sewer Extension and Secondary Development

Odors are not expected to be an issue during or after the extension of trunk sewers. However, there may be some short-term, fugitive wastewater odors in the general vicinity of the locations where the new and existing sewer lines are connected or at locations where pump-around activities occur.

24.b.3 Dust

Fugitive dust generated during the construction associated with the RWRP Expansion, trunk sewer extension, and secondary development will be generated by earth moving equipment and material handling operations. Emissions are based on the estimated amount of earth moved and material handling. The RWRP Expansion, trunk sewer extension, and secondary development construction activities will require excavating and handling large volumes of soil. Dust will be generated as part of construction activities such as grading, the stockpiling and placement of aggregate material, cement delivery, and paving activities. A portion of this dust would consist of PM_{10}.

Where possible, paved roads will be used to access construction areas in an effort to minimize dust from construction equipment. Water trucks will be used to wet areas of exposed soils during dry and/or windy conditions. Permanent vegetation will be established both as an erosion control measure and to minimize dust generation after construction is complete.

25.0 NEARBY RESOURCES

Are any of the following resources on or in proximity to the site?

a. Archaeological, historical, or architectural resources? ☒ Yes ☐ No
b. Prime or unique farmlands or land within an agricultural preserve? ☒ Yes ☐ No
c. Designated parks, recreation areas, or trails? ☒ Yes ☐ No
d. Scenic views and vistas? ☒ Yes ☐ No
e. Other unique resources? ☒ Yes ☐ No

If yes, describe the resource and identify any project-related impacts on the resources. Describe any measures to minimize or avoid adverse impacts.

25.a Cultural Resources

25.a.1 Introduction

During August of 2003, The 106 Group Ltd. (The 106 Group), a cultural resources consulting firm, conducted a preliminary cultural resources assessment in the form of a file review and windshield survey of the RWRP Expansion site, trunk sewer extension corridors, and areas of potential secondary development. The assessment is reported in the technical memorandum entitled *Cultural Resources Assessment for the Rochester Water Reclamation Plant Expansion – Trunk Sewer Extensions Project, Rochester, Olmsted County, Minnesota* on file with the City and State Historic Preservation Officer (SHPO). For reasons of site preservation, this technical memorandum is only availably by specific request from the SHPO. The purpose of this assessment was to identify any historic properties within the Project Area that may require further investigation or consultation in order to determine their potential eligibility for listing on the National Register of Historic Places (NRHP) and to eliminate those properties that are clearly not eligible. In addition, the investigation assessed the Project Area's potential for containing previously unidentified archaeological resources. The SHPO coordination letter for this EAW is included in Appendix A.

There are many federal laws that govern the treatment of historic, archaeological and cultural resources. However, the most relevant and meaningful federal law for the RWRP Expansion – Trunk Sewer Extension EAW is the National Historic Preservation Act of 1966. In addition, there are three state laws that also pertain to projects in Minnesota.

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The SHPO acts on behalf of the Advisory Council in each state. The Section 106 process seeks to accommodate historic preservation concerns with the needs of federal undertakings through consultation among the agency officials and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess the effects of the undertaking and seek ways to avoid, minimize, or mitigate any adverse effects on historic properties. A federal undertaking includes such activities as transferring funds, issuing permits, and providing loans.

The Minnesota Historic Sites Act (M.S. 138.661 - 138.6691) created a state register of properties "possessing historical, architectural, archaeological, and aesthetic values" and outlines a consultation process for projects that will affect historic sites. Historic sites are defined as properties named in the Act or listed on the NRHP. Similar to federal regulations, any undertaking receiving funding or licensing by any political subdivision is covered by the Act. If the undertaking affects historic sites, the agency must consult with the Minnesota Historical Society (MHS) to avoid or mitigate adverse effects.

The Minnesota Field Archaeology Act (M.S. 138.31 - 138.42) applies to state archaeological sites. A "state archaeological site" is defined as any publicly owned or leased land or water area that contains material of archaeological interest. The Act created the Office of State Archaeologist (OSA), which, along with the MHS, oversees compliance with the Act. When a state archaeological site is known or suspected to exist the controlling agency must submit development plans to MHS and OSA for review. The controlling agency, in consultation with MHS and OSA, is directed to preserve such sites (which may include data recovery) and is authorized to use its funds for such activities. If a site is related to American Indian history or religion, OSA must coordinate with the Minnesota Indian Affairs Council for review and comment.

The Minnesota Private Cemeteries Act provides protection for marked and unmarked human burials and remains. The Act directs the OSA to authenticate all burial sites. Only burials older than 50 years are covered by this Act. When human remains or burials are American Indian, the OSA and the Minnesota Indian Affairs Council (MIAC) must attempt to identify their tribal identity. When Indian burials are known or suspected to

exist on public lands, the political subdivision controlling the land must submit development plans to the state archaeologist and the MIAC for review prior to advertising bids.

If regulatory review and permitting for the RWRP Expansion, trunk sewer extension, or future development projects involve funding or permitting through state or local entities, consultation with the SHPO is appropriate. Also, consultation with OSA or MHS may be required based on the types of resources present, as described in the preceding paragraphs. However, if there is federal involvement (e.g., through funding or permitting), consultation with SHPO and the federal agency responsible for the funding or permitting will be required.

The preliminary gathering of cultural resources data included background research, a visual reconnaissance of the Project Area, assessment of archaeological potential within the Project Area, and photographic documentation of buildings and structures that have been previously recorded or appear to have potential for NRHP eligibility based on age, integrity, and the potential for historical significance.

25.a.2 Background Research and Modeling

The area studied for archaeological impacts included all areas where construction or other ground-disturbing activities related to the proposed projects might take place as shown on Figures 25-1 through 25-3, covering approximately 22,000 acres (8,903 hectares). On August 14, 2003, prior to conducting fieldwork, background research was conducted using the Minnesota SHPO site files for information on previously identified archaeological sites and architectural history properties within 1 mile (1.6 kilometer [km]) of the Project Area and on cultural resources surveys previously conducted within the Project Area. In addition, researchers examined historical aerial photographs of the Project Area.

The MnDOT Minnesota Archaeological Predictive Model (Mn/Model) was also used. It is based upon the use of archaeological and environmental data to generate preliminary predictions of the possible presence of archaeological resources within a given location. Two applications of this model, the surface archaeological constraints model and the buried archaeological constraints model, were used to gather predictive information for this preliminary investigation.

25.a.3 Field Methods

25.a.3.1 Archaeology

Mn/Model indicates the presence and estimated severity of potential archaeological constraints to development, based on available archaeological data and predictive models. The following information is quoted directly from the MnDOT (2000) website:

"This model depicts archaeological constraints at the ground surface. It is interpreted from known archaeological site locations as described below, probability models based on the distribution of known archaeological sites as of 1997, and locations of a sample of previous archaeological surveys that were mapped for Mn/Model. The model also considers Landscape Suitability Rankings in areas where that information is available. Categories of surface archaeological constraints are:

- Areas to keep development out of (burials and earthworks)
- Areas requiring some sort of control (sites listed on or determined eligible for listing on the NRHP)
- Areas with inherent limitations (other sites and areas with high to medium site potential)
- No known constraints (known negative surveys, no landscape suitability, and low site potential)
- Unsurveyed."

The project archaeologist conducted a windshield survey of the Project Area to refine the level of pre-contact (pre-Euro American activity) archaeological potential of areas designated by Mn/Model as areas to keep development out of, areas requiring control, areas with limitations, and unsurveyed areas. With the exception of

unsurveyed areas, these areas were considered to have moderate to high pre-contact archaeological potential. Therefore, during the assessment, these levels of potential were refined based on whether an area had been impacted in some manner that would lessen the potential for intact pre-contact archaeological resources. Areas designated as unsurveyed by Mn/Model were assessed to identify areas with moderate or high archaeological potential. Areas of moderate or high archaeological potential were defined as the undisturbed portions of the Project Area that are:

- Within 500 feet (150 meters) of an existing or former water source of 40 acres (19 hectares) or greater in extent, or within 500 feet (150 meters) of a former or existing perennial stream.
- Located on topographically prominent landscape features.
- Located within 300 feet (100 meters) of a previously reported site.
- Located within 300 feet (100 meters) of a former or existing historic structure or feature (such as a building foundation or cellar depression).

In addition, archaeologists compared historical documentation, such as plat maps, with current field conditions to assess the potential within the survey area for intact post-contact archaeological sites. Post-contact sites are habitations, farmsteads, and human activities dating to an early period of Euro-American activity. Regardless of whether the structures are extant (still present) or not, their locations are considered to have moderate to high potential for post-contact archaeological resources.

Areas designated by Mn/Model as having no known archaeological constraints (known negative surveys, no landscape suitability, and low site potential), and areas in which Holocene (less than 10,000 years old) deposits have been significantly disturbed were assessed as having little or no potential for containing intact archaeological resources. They were not, therefore, assessed for pre-contact archaeological potential during the field survey.

25.a.3.2 Architectural History

The Project Area was also assessed for potential architectural and historical resources. As development plans emerge, consideration should be given to additional evaluation of architectural and historical resources and should take into account effects from the proposed developments, such as potential land acquisition, changes in property access and settings, traffic patterns, traffic volume, vibration, noise levels, air quality, land use, and visual effects.

During a survey of the Project Area, surveyors located previously recorded properties that were either listed on the NRHP, determined eligible for listing on the NRHP, or had not been evaluated for listing on the NRHP to assess their current status and condition. Properties previously evaluated as not eligible for listing on the NRHP were assumed to still be not eligible and, therefore, were not recorded during this assessment.

Staff of The 106 Group also surveyed the Project Area to identify previously unrecorded properties that retain sufficient historical integrity and appear to have the potential to be historically significant. Surveyors identified six additional properties within the Project Area meeting these criteria.

25.a.4 Previous Investigations

Seven archaeological surveys and several architectural and historical surveys have been previously conducted within the Project Area.

Two archaeological sites that were previously identified in the Project Area during archaeological surveys were not assigned formal site numbers, because one was on an eroded landform and the other consisted of an isolated find. Three other previously identified archaeological sites have been reported, but not field checked, within the Project Area. Twenty-two previously recorded architectural history properties occur within the Project Area.

25.a.5 Results

25.a.5.1 Pre-Contact Archaeology Assessment

The natural topography of the Project Area is generally undulating, consisting of rolling fields and wooded areas, as well as the South Fork of the Zumbro River and several of its small tributaries. However, existing residential, industrial, and commercial development; gravel mining; road construction; sewage treatment facilities; and a landfill have altered much of this topography. In addition, future urban and suburban growth will continue to impact the Project Area over time.

There have already been development impacts within the Project Area that have resulted in heavy disturbance to many of the locations classified by Mn/Model as areas with limitations (having high to medium site potential), or unsurveyed. These locations, which without existing development would otherwise be considered to have a moderate to high potential for pre-contact (pre-Euro American activity) archaeological resources, are now considered to have low potential for intact pre-contact archaeological resources. The general locations of these areas identified as having a low potential for pre-contact archaeological resources due to disturbances are shown in Figures 25-1 through 25-3. It should be noted that these are based on preliminary observations and will, therefore, need to be refined during future studies associated with future development projects.
Mn/Model classifies a few locations within the Project Area as having no known constraints (known negative surveys, no landscape suitability, and low site potential), or unsurveyed. These locations are classified as such because they are considered to have low pre-contact archaeological potential. They were not therefore, assessed for pre-contact archeological potential.

Mn/Model classifies the remaining portions of the Project Area as areas with limitations (due to other reported sites and areas with high to medium site potential), or unsurveyed and that appear to be undisturbed. The undisturbed areas with limitations or those that are unsurveyed are considered to have moderate to high potential for pre-contact archaeological resources. The undisturbed unsurveyed areas are in proximity to the South Fork Zumbro River and its tributaries and, with the exception of any wetlands that may be present, are therefore considered to have moderate to high potential for intact pre-contact archaeological resources.

25.a.5.2 Post-Contact Archaeology Assessment

Early plat maps (Geo. A. Ogle & Co. 1896) depict several structures within the Project Area. Because these structures represent habitations, farmsteads, and human activities dating to an early period of Euro-American activity in Minnesota, whether the structures are still present (extant) or not, their locations are considered to have moderate to high potential for post-contact archaeological resources. The many impacts to the Project Area already discussed, however, have resulted in heavy disturbance to many of these locations. Of these locations, therefore, those that have been heavily disturbed are considered to have low potential for intact post-contact archaeological resources. Those that appear to be undisturbed are considered to have moderate to high potential for intact post-contact archaeological resources. The confirmed existence or potential significance, however, of any post-contact archaeological resources within the Project Area is not known and could only be determined by site-specific investigations that are recommended for consideration as part of future development projects.

25.a5.3 Agency Consultation Regarding Archaeology

The SHPO should be consulted prior to approval of developments within areas of known archaeology sites with potential significance and areas with moderate to high potential for archaeological and post-contact archaeological significance. Within the Project Area, those areas that have already been heavily disturbed by development are considered to have low potential for intact archaeological resources. No further archaeological investigation, therefore, is recommended for these areas.

Those undisturbed areas identified by Mn/Model as having no known archaeological constraints, due to known negative surveys, no landscape suitability, and low site potential, are considered to have low potential for pre-contact archaeological resources. No further archaeological work related to precontact resources, therefore, is recommended for these areas.

Those undisturbed areas identified by Mn/Model as areas with limitations, due to other reported sites and areas with high to medium site potential, and unsurveyed are considered to have moderate to high potential for intact pre-contact archaeological resources. It is recommended that when development projects that trigger SHPO review or Section 106 consultation have the potential to impact these areas, consultation be conducted with the SHPO and relevant federal agency regarding further assessment requirements.

Those undisturbed areas in which structures were located historically are considered to have moderate to high potential for intact post-contact archaeological resources. Phase I documentary research on the ownership and occupational history of these locations will be required to determine whether any archaeological sites that might exist in these locations hold potential historical significance. It is recommended that when development projects are expected to impact these areas, consultation be conducted with the SHPO and relevant federal agency regarding further assessment requirements.

25.a.5.4 Architectural and Historical Resources Assessment

The Project Area is generally comprised of recent urban and suburban development, along with settlement era agricultural lands with scattered farmsteads. Several gravel pits have historically operated and presently operate within the Project Area. The only historically urbanized location within the Project Area is the Village of Douglas, containing about 40 properties.

The agricultural history of Rochester and Minnesota is the primary historical context for the evaluation of properties within the Project Area. Most farmstead properties were assessed to determine their ability to represent the agricultural heritage of the area by having a house and barn with good integrity, as well as a complement of historical outbuildings. In addition, properties that appeared to have architectural merit were recorded if they retained sufficient integrity.

25.a.5.5 Agency Consultation Regarding Architectural History

Prior to approval of development projects involving the listed properties or in their vicinity, it is recommended that consultation be conducted with the SHPO and relevant federal agency to determine if further assessment or mitigation is necessary. Additionally, similar procedures should be followed for properties that were not accessible and/or visible during the windshield survey to determine if potentially eligible properties exist at those locations. Approximately ten percent of the Project Area was not visible or accessible during the windshield survey.

25.b Prime or Unique Farmlands

Prime farmland, as described by the NRCS, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses.

According to the list of prime farmland soils in Olmsted County, of a total of 7,904 acres in the King's Run area, there are approximately 4,255 acres of prime farmland. Of a total of 7,703 total acres in the Northwest Territory area, 3,704 acres are prime farmland. In the Hadley Valley area, of a total of 6,307 total acres, there are 2,596 acres of prime farmland. Of the 21,914 acres in the entire Project Area, 49 percent (10,555 acres) is prime farmland. There are approximately 10,831 acres of active cropland in the Project Area.

The Project Area contains agricultural lands that are generally not contiguous. Their economic land values do not support continued agricultural practices when compared to development opportunities. Additionally, it is within the policy framework of both Olmsted County and the City to support urban development within close proximity to the City, thus preventing urban sprawl and the continued depletion of agricultural lands in Olmsted County. The northern one-third and the western one-third of Northwest Territory, the western one-third of Kings Run, and eastern one-third of Hadley Valley are within the designated Resource Protection Areas (for agriculture and aggregate mining) identified in the *Olmsted County General Land Use Plan*. Prime farmland will be temporarily impacted by construction of the trunk sewer extensions. Development attributable to the availability of municipal services will result in permanent depletion of prime farmlands. Expansion of the RWRP will not impact any prime farmland.

As part of trunk sewer construction and prior to secondary development, methods to minimize or avoid adverse impacts to prime farmland include the removal and stockpiling of topsoil separately from other soil materials so that topsoil can be replaced after other material has been used to backfill utility trenches, along with measures to limit the compaction of topsoil during replacement.

25.c Designated Parks, Recreation Areas, or Trails

There are 20 parks and 8 proposed parks (as identified in the City of Rochester Park System map, Appendix G) within the Project Area. No Olmsted County Parks are located within the Project Area.

Expansion of the RWRP will not impact any designated parks, recreation areas, or trails.

The conceptual alignment of the trunk sewer extensions will run nearby and within several area parks and recreation areas. With the exception of tree removal above the sewer line, impacts to parks and public lands will be temporary and related to construction activities. The trunk sewer extension will not cause permanent interference with or change the use of any existing parks, recreation areas, or trails. Construction-related noise and traffic may be noticeable to park users and may result in temporary access impacts, reduction in park usage, or reduction in the level of enjoyment by park users.

Future residential developments will result in the expansion of the City's park and trail system. Individual developments are required by the *City of Rochester Code of Ordinances* to dedicate neighborhood or community parks as part of their development plans. Individual developments can also establish trail connections that link new developments with the City's trail system and other residential neighborhoods. Potential environmental corridors along major natural features that are un-developable present opportunities for preservation as part of the stormwater management system. These natural corridors may also provide trail corridor opportunities, but there are no specific plans for the extension of the City's trail system along these corridors at this time.

The proposed trunk sewer extension will run through or adjacent to portions of **Foster Arend Park** and **Hawthorne Hills Park** in Hadley Valley and portions of **Northern Hills Park** and **White Oaks Park** in King's Run. There are no park impacts in the Northwest Territory.

- **Foster Arend Park** is located at 37th Street and East River Road NW. The 40.7-acre park features picnic areas, restrooms, playground equipment, open play fields, a sand volleyball court, horseshoe courts, a lake, a swimming beach, fishing, paved and unpaved trails, and rentable space.
- **Hawthorne Hills Park** is located at 1925 48th Street NE. This park is a 206-acre golf course with a building.
- **Northern Hills Golf Course – Pro Shop** is located at 4721 West Circle Drive NW. This area is a 200-acre golf course with pro shop.
- **White Oaks Park** is located on the 4500 Block of 55th Street NW. White Oaks Park is 22.7 acres and consists of playground equipment, an open play field, a baseball/softball field, a basketball court, an ice-skating rink, and a paved trail.

Portions of future parks (**Weather Stone, Ridgeview Manor,** and **Harvest View)** may also be impacted by the trunk sewer extension in Kings Run. These three parks are currently undeveloped with proposed acreage of 8, 6.1, and 12 acres, respectively. In addition, portions of the proposed trunk sewer extension will run on City lands adjacent to the **Douglas State Trail**, a 13-mile multi-use trail which runs from the City northwest to Douglas and Pine Island. Designated uses of this trail include bicycling, walking, inline skating, horseback riding, and snowmobiling. There will be no impacts to the trail corridor itself.

25.d Scenic Views and Vistas

No scenic view or vistas are present at the RWRP site.

The impacts of trunk sewer extension are temporary and no scenic views or vistas will be impacted.

The topographic high areas within the Project Area provide opportunities for panoramic views of the valleys and associated stream corridors. As development occurs, homes or other buildings may block desirable views and vistas. Also, structures adjacent to steep slopes will be very visible from low-lying areas.

25.e Other Unique Resources

Primary and secondary aggregate resources occur throughout the Project Area, including along portions of the trunk sewer conceptual alignment, in the northeast corner of the RWRP potential expansion site, and interspersed throughout the area available for secondary development (Figures 19-1 through 19-3; prepared by ROPD based on the Olmsted County Geologic Atlas Plate 9 of 9, MGS 1988). Based on the narrow extent of the construction limits, the installation of the proposed trunk sewer extensions will not significantly decrease the potential use of these resources in the future in those areas. Resources mapped as being in the northeast corner of the RWRP potential expansion site are actually not existent due to their past excavation to create the former sewage sludge storage lagoons. Individual property owners decide whether or not aggregate reserves are extracted prior to secondary development. Although it is feasible to extract aggregate resources with the intent to provide final topographic contours to enable later development, not all property owners choose to facilitate both uses, particularly in areas where water tables are higher than the base elevations of the aggregate resources.

26.0 VISUAL IMPACTS

Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks?
☒ Yes ☐ No
If yes, explain.

26.a RWRP Expansion

Temporary visual impacts are expected during construction activities, including the presence of construction equipment and materials at the site, stockpiles of excavated soil, and potentially construction lighting if construction activities take place at night. Approximately one acre of trees will be removed. The aesthetic benefit of providing visual screening of the expanded facility from 37th Street will be evaluated as part of the design process.

26.b Trunk Sewer Extension

Temporary visual impacts are expected during trunk sewer extension construction activities, including the presence of construction equipment and materials at the site, stockpiles of excavated soil, and loss of trees. After construction, the sewer trench will be restored to near-original conditions; therefore permanent visual impacts beyond the loss of woody vegetation directly above the sewer line are not anticipated. If micro-tunneling construction methods rather than traditional trench and fill construction methods are used, the impacts related to excavation will be reduced. There is the potential that pump stations will be required as shown in Figure 5-4. These are small structures and will be constructed in a manner consistent with City requirements, resulting in very minimal visual impact.

26.c Secondary Development

Visual impacts of development on scenic views were discussed in Item 25.d. Development in the Project Area will become more dense over time, assuming a more urbanized appearance. Street lighting will be added as areas develop.

27.0 COMPATIBILITY WITH PLANS AND LAND USE REGULATIONS

Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency?
☒ Yes ☐ No
If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

There are two components of this project that are subject to local planning initiatives such as comprehensive land use plans and regulatory tools such as zoning ordinances. Figures 27-1 and 27-2 present county and city land use plans, respectively.

The first component is the physical expansion of the RWRP. The *Rochester Comprehensive Plan and Land Development Code* provide guidance as to the appropriateness of the use and site design. The RWRP is an essential public facility that supports the preservation and orderly growth of the City. The site of the RWRP Expansion is designated by the land use plan as "Public" which supports the RWRP use. All applicable provisions of the *Land Development Code* will be followed relative to site design (i.e. setbacks, heights, landscaping, etc.).

The second component of the project is the connected actions and secondary impacts associated with extension of trunk sanitary sewers. These impacts are associated with resultant development that, absent a municipal sanitary sewer system, would otherwise occur at a lower suburban density. Development that occurs as a result of trunk sanitary sewer extension will occur within the City limits. The City has a Land Use Plan, Zoning Ordinance and Land Development Manual. Rochester has also endorsed policies that have been addressed by Olmsted County for areas outside of its city limits, but within its USAs.

Outside of the City limits interim development may occur prior to areas being annexed to the City and provided municipal services. According to the City and Olmsted County land use regulations, interim development is designed to facilitate development that will ultimately be served by municipal infrastructure, prior to having infrastructure systems available. This process ensures that development occurring in the "interim" will efficiently transition to a more urban pattern when services become available. This type of development will be subject to the orderly development procedures, plans and regulations of the affected townships, small cities, and Olmsted County. In addition to the City, the Project Area includes portions of the unincorporated village of Douglas and the townships of Cascade, Haverhill, Kalmar, New Haven and Oronoco. Small portions of the Project Area have been identified as expansion areas for the City of Oronoco and the Village of Douglas (Figure 27-3).

Olmsted County is the primary regulatory authority outside of municipal limits. Chapter Five of *Olmsted County's General Land Use Plan* (GLUP) states that the *Olmsted County Zoning Ordinance* should establish special districts where residential development within the interim development areas are permitted through planned unit developments (Olmsted GLUP). The GLUP identifies specific requirements for these special district developments such as the establishment of an escrow account to pay for future infrastructure costs and platting arrangement that allow for future lot splits. Consistent with requirements noted in the GLUP, *Olmsted's Zoning Ordinance* requires a GDP for any land use plan amendment, zoning change, or subdivision of land, which requires platting within an USA.

In addition to special districts for interim development, *Olmsted's Zoning Ordinance* permits the creation of special districts to allow administration of land use regulations at the township level (Section 8.10). Special districts have been created for the townships of Haverhill, Kalmar and New Haven, which require cooperation with the County to ensure consistency with Land Use Plan policies (Sections 8.15, 8.20, and 8.17). Plans and procedures for the development in the Project Area are described in more detail below.

27.a City of Rochester

Table 27-1 provides a summary of the undeveloped acres of the Project Area, which fall in the current City limits of Rochester, its 25-year USA, its 50-year URA, and the area outside these three jurisdictions but within the sewersheds delineated as the Project Area for this EAW. Figure 27-1 provides a graphical representation of the various boundaries. About 25 percent of undeveloped land within the Project Area falls outside of the City's jurisdiction. Proposals for development within the City will be subject to the elements of the various plans and regulations that constitute its Comprehensive Plan. Rochester's current Comprehensive Plan is made up of fourteen elements listed in Table G-1 in Appendix G.

TABLE 27-1

DEVELOPABLE ACRES WITHIN PROJECT AREA

Sewershed	Total Undeveloped Acres	Within City Limits	Within Rochester 25 Year USA	Within Rochester 50 Year URA	Outside Rochester Jurisdiction
Kings Run	3,015	176	2,791	9	36
Northwest Territory	6,058	216	4,159	0	1,685
Hadley Valley	4,101	202	889	1,508	1,502
Total Project Area	**13,174**	**593**	**7,822**	**1,517**	**3,222**

Note: Includes both developable and constrained acres as shown in Table 9-1.

The City's Land Use Plan provides both general and specific neighborhood recommendations for future land uses within City limits (Figure 27-2). Development patterns within the City that are outlined in the City's Land Use Plan will serve as a guide for future development in the Project Area, with low-density residential being the predominant land use. There are areas of medium density residential and commercial in the Kings Run region. There are also two areas proposed for industrial development, one near the intersection of CRs 22 and 4 and the other near the intersection of TH 63 and CR 22.

The City has policies and procedures in place to prevent potential land use conflicts from arising when new development occurs next to existing neighborhoods. The GDP review process enables the City to check for potential issues and help guide the development around possible conflicts. In addition, the *City of Rochester Zoning Ordinance and Land Development Manual* has a specific provision that addresses compatibility issues between small and large lots (Section 64.111, Minimum Lot Standards).

The *City's Zoning Ordinance and Land Development Manual* remains consistent with the Land Use Plan while further defining appropriate uses and standards. Amendments and updating procedures have been established for both the *Land Use Plan* and the *Zoning Ordinance and Land Development Manual* to ensure the documents are consistent with the community's goals.

27.b Olmsted County

Rochester and Olmsted County have a joint Planning Department to facilitate development that is compatible with adjacent land uses in a sensible and cooperative manner. Because of this, many of the City's policies have been incorporated into the *County's GLUP* (last updated February 3, 2003) and *Zoning Ordinance* (updated February 8, 2001). Both of these documents apply to all areas of Olmsted County outside of municipal boundaries, including interim developments outside the City's current limits, but within the City's USAs and URAs. The GLUP has two major land uses, Urbanizing Areas and Resource Protection Areas (Figure 27-1).

Urbanizing Areas include land already within municipal boundaries, future USAs, URAs, and adjacent lands identified for suburban development (rural residential development with private wells and septic systems on large lots). Although the GLUP does not identify specific land uses within the urbanizing areas, the land use policies are focused on orderly development and the integration of compatible land uses. The intent of the GLUP is to provide a framework so the County, townships, and municipalities can coordinate land use decisions, which will not inhibit future urban growth in a manner that contributes to unnecessary urban sprawl.

The four types of urban designations are the current City limits, the 25-year USA, the 50-year URA, and Suburban Development Area (SDA). USAs are areas adjacent to the City needed to accommodate future development until 2020. URAs consist of outlying areas that are intended to accommodate growth between 2020 and 2045 while allowing for changes in growth and development patterns. SDAs are large-lot residential development with no municipal water or sewer services that are intended for long-term low density residential development. There is one area within the Project Area that falls into the SDA category (Figure 27-1).

Olmsted County's *GLUP and Zoning Ordinance* limit the type of residential development possible within the USAs and URAs. Properties located in the 25-year USA that will have municipal services available within 10 years cannot develop unless annexation occurs. Properties within the 25-year USA that will not have municipal services available for more than 10 years can develop as an "interim development" (see previous description) as long as an Orderly Annexation Agreement has been reached between the township and municipality. This type of development must ensure that future utility connections are provided for and that transitions to municipal jurisdiction occur as smoothly as possible. Properties within the 50-year URA can also develop as an "interim development" as long as an Orderly Annexation Agreement has been reached between the township and municipality.

Olmsted County's RPAs primarily provide for economically viable land uses, such as agriculture and aggregate resource extraction. The Olmsted GLUP's policies for RPAs also state that sensitive environmental areas should be protected and their development discouraged. Sensitive environmental areas include areas prone to unstable environmental conditions, sensitive to human impacts, or that are an unacceptable risk to human health due to present or past pollution (*Olmsted County GLUP*). About 25 percent or 3,220 acres of the developable land in the Project Area falls within the Resource Protection Area (RPA) designation. Some existing and future land uses in these areas include agriculture, agricultural related commercial uses, communication towers, and utilities. Future land uses also include large developments like airports, landfills and mining. RPAs were identified using the Comprehensive Land Use Evaluation System Model based on soil resources, parcel size, existing resource investment, existing land uses, and proximity to existing or planned public lands or facilities. In this area there is limited non-farm residential development, as well as controls on other types of commercial or industrial development.

27.c Other Jurisdictions

The City works with nearby small cities and townships within Olmsted County to facilitate compatible, efficient, and orderly development. An example of this cooperation is the September 3, 2003 Orderly Annexation Agreement reached between the City and Kalmar Township. This agreement covers 1,750 acres of developable land within the Project Area (Figure 27-3). The Orderly Annexation Agreement limits non-farm development higher than permitted by the County Zoning Ordinance for the 853 acres in the 0 to 10 year area. The agreement also has a provision that allows interim residential development for the 897 acres in the 11 to 25 year area. Interim residential development is allowed as long as the developer agrees to construct a community-based water system and approved sewage treatment system, which can be fully compatible for incorporation into the City's system. Part of the agreement, which has already been implemented, included a request to Olmsted County that the land use designation for this area be changed to USA from RPA.

Additional changes to *Olmsted County's GLUP* for RPA designations may also occur. The City of Oronoco, north of Rochester, has recently adopted a land use plan, which extends its USA south to meet the north boundary of Rochester's USA. In the Project Area, about 135 acres will need to be changed in the Olmsted County Land Use Plan from RPA to Urbanized Area to accommodate *Oronoco's Land Use Plan* (Figure 27-3).

Another section of the Project Area where a local jurisdictional land use plan is different than the *Olmsted County Land Use Plan* is in New Haven Township and the unincorporated Village of Douglas. Recognizing that there may be requests to develop land in and around the village of Douglas, the New Haven

Township Board of Supervisors has adopted a *Land Use Plan*, which guides future land use decisions for 448 acres in the Project Area (Figure 27-2). As Table 27-2 below shows, this *Land Use Plan* includes a mixture of residential, residential/business, commercial, and recreational uses.

TABLE 27-2
VILLAGE OF DOUGLAS LAND USE PLAN

Land Use	Total Acres
Commercial	24
Floodplain	65
Open Space Recreation	57
Residential	247
Residential/Business	55
Total Land Use Plan	448

The *Olmsted County GLUP and Zoning Ordinance* both identify Douglas as a Rural Service District, however the *Village of Douglas Rural Service District in the Zoning Ordinance* consists of only 21.5 acres. The intent of the Rural Service District is to allow limited residential, commercial and industrial development as long as it is not detrimental to the character or purpose of the community. According to ROPD staff, the Olmsted County Board has reviewed the *Village of Douglas Land Use Plan* and deemed it consistent with the intent of the *Olmsted County Land Use Plan.*

Additional revisions to the *Olmsted County Land Use Plan* are likely as the Rochester region continues to grow. ROPD staff has indicated that discussions are currently underway between Oronoco Township and City for an Orderly Annexation Agreement. If an Orderly Annexation Agreement is reached, it is likely that additional parcels will be changed from RPA to Urbanized Area.

27.d Rochester Public School District 535

Additional residential development in the Project Area will have an impact on Rochester Public School District 535. The Rochester School District's *Facilities 2018 Working Papers for Long Range Planning* (January 2003) identifies potential steps to meet increasing enrollments due to the growth of the region. Utilization of facility capacity during the 2002 to 2003 school year was above 79 percent for all District facilities, with northwest Rochester facilities at or above capacity. To accommodate future growth, the School District has identified potential elementary, middle, and high school construction needs in the Project Area. Additional strategic planning and coordination among local governmental units will be needed to ensure facilities are constructed efficiently and at the appropriate time and location to meet increased demand.

28.0 IMPACT ON INFRASTRUCTURE AND PUBLIC SERVICES

Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? ☒ Yes ☐ No

If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

This EAW addresses RWRP Expansion, trunk sewer extension, and secondary development. The list below refers to sections of this EAW that identify new or additional infrastructure or services required to serve the project that are not repeated her.

- Question 6 - Wastewater treatment and sanitary sewer
- Questions 13 and 19 – Municipal water wells, water towers, and water supply
- Question 17 - Stormwater management
- Question 21 - Transportation system
- Question 27d - Schools

28.a Emergency Response

Police, fire, and ambulance staff respond to all 911 emergency service calls. The training for these emergency service providers is integrated so that whoever arrives first at the scene takes charge until the entity most appropriate to the situation arrives. Rapid response times are therefore interdependent between these providers and important to all, thereby helping to insure that evolution of new service locations will move forward as necessary to meet community demands.

No fire stations, police stations, or ambulance service locations are currently within the Kings Run, Hadley Valley, or Northwest Territory areas. However, the 41st Street Fire Station, located at 1875 41st Street NW, is located on the southern Kings Run Project Area boundary. Current fire response times for the east half of Kings Run, the west half of Hadley Valley, and the southeastern quarter of the Northwest Territory range from approximately four to six minutes. The remaining areas of Kings Run, Hadley Valley, and Northwest Territory have not had response times calculated. Undoubtedly, new fire stations will be needed as the City expands, however, there are no specific locations identified within the Project Area at this time.

Rochester police services originate from City Hall, located in downtown Rochester. However police cruisers can and do use the fire stations as satellite facilities. This practice is expected to continue in the future and expand as new fire stations are added.

Ambulance service is a private enterprise in Rochester. Currently, ambulance dispatch occurs from a location near downtown and a location on the far south side of Rochester.

As required, other infrastructure services including electricity, natural gas, telephone, and cable will be extended to the currently unserved areas of Kings Run, Northwest Territory, and Hadley Valley as these areas develop.

29.0 CUMULATIVE IMPACTS

Minn. R. 4410.1700, subp. 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts (or discuss each cumulative impact under appropriate item(s) elsewhere on this form).

The cumulative impacts of RWRP Expansion and trunk sewer extension consist of secondary development and have already been addressed throughout this EAW. Potential impacts of RWRP Expansion, trunk sewer expansion, and secondary development have been identified. Mitigation measures to avoid, minimize, and/or mitigate the identified potential environmental impacts have been also been addressed.

Future individual development and infrastructure projects that may occur within the Project Area may also be subject to EAW preparation regulations. Regardless of EAW regulations, these future development and infrastructure projects will be subject to the City's GDP review process and will have to obtain all required

permits at the time the project is constructed. Table A-3 (Appendix A) presents a list of potential permits related to future secondary development. Due to the more than 30-year development period, regulatory and permit requirements pertaining to future development and infrastructure projects will change and as new requirements are instituted they will be applied, when applicable.

30.0 OTHER POTENTIAL ENVIRONMENTAL IMPACTS

If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

No environmental impacts other that those noted in the previous responses are anticipated.

31.0 SUMMARY OF ISSUES

List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

The issues below may require additional evaluation.

31.a RWRP Site

31.a.1 Wetlands

Based on MLCCS land cover mapping and hydric soils mapping there is limited potential for wetlands on the RWRP construction site. However, the potential wetland areas appear to be related to existing ditches. Nontidal drainage ditches are not considered waters of the United States and may be exempt from USACE Section 404 permit requirements. The areas may be considered jurisdictional wetlands under the WCA criteria, if they meet specific hydric soil, hydrology, and hydrophytic vegetation requirements. Field verification will be conducted in the spring of 2004, particularly in the ditch along the eastern portion of the proposed expansion area, where the box culvert will be installed, the stormwater drainage way rerouted, and the remaining portions of the construction site that did not have wetland evaluations as part if the earlier VIC project. If necessary, delineation will then proceed to quantify wetland impacts for Section 404 and WCA permits.

If wetlands cannot be avoided, construction techniques that may minimize wetland impacts will be evaluated. The combination of avoidance, minimization and mitigation is referred to as *Sequencing*, and this process will be employed during final design and permitting for the construction of the RWRP Expansion.

31.a.2 Cultural Resources

A review of historic aerial photography showed that a farmstead, no longer present, had been located in the proposed RWRP Expansion area. The City will consult with the SHPO regarding development at the site. It is not currently anticipated that mitigation measures will be required for the site, but this will also be determined in coordination with the SHPO.

31.b Trunk Sewer Extensions

31.b.1 Wetlands

Field identification, verification, and delineation to quantify wetland impacts for Section 404 and WCA permits will be required for the trunk sewer extension corridors as part of the final design and permitting process. Sequencing will be employed during final design and permitting for the construction of the trunk sewer extensions.

31.b.2 Cultural Resources

Coordination with the SHPO will be required for the trunk sewer extensions to determine if any additional cultural resource surveys will be required.

31.c Secondary Development

Future individual development proposals and other infrastructure projects that may occur within the area to be served by the RWRP Expansion and trunk sewer extensions, if sufficiently large, may also be subject to EAW preparation under the residential, commercial, or industrial mandatory categories for EAW preparation, or due to exceeding thresholds for other EAW categories.

These future development and infrastructure projects will be subject to the City's GDP review process and will have to obtain all required permits prior to project construction. Table A-3 (Appendix A) presents a list of potential permits related to future secondary development. Due to the more than 30 years within which development of the area may occur, regulatory and permit requirements pertaining to future development and infrastructure projects can be expected to change. As new requirements are instituted, they will be applied, when applicable. Mitigation measures not already identified in this EAW will be determined as part of the City's GDP review process and as part of obtaining required permits.

RGU CERTIFICATION.

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minn. R. 4410.0200, subps. 9b and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Name and Title of Signer: **Beth G. Lockwood, Supervisor, Environmental Review Unit**
Operations and Environmental Review Section
Regional Environmental Management Division

Date:

The format of the Environmental Assessment Worksheet was prepared by the staff of the Environmental Quality Board at Minnesota Planning. For additional information, worksheets or for *EAW Guidelines*, contact: Environmental Quality Board, 658 Cedar St., St. Paul, MN 55155, 651-296-8253, or at their Web site http://www.mnplan.state.mn.us.